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EDUCATION, AGING AND MEANINGFUL SURVIVAL*

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The National Conference on Problems of Aging is convening at a most appropriate time. Factually, it had to happen. The dramatic changes occurring at all levels of individual and collective life are having a forceful impact on all living things. These changes are in progress as the result of significant new knowledge which has accrued concerning man and the world in which we live.

An important dimension is being added to the human equation. The life line is being extended. We are gradually living longer; there are a great many more of us all over the world. We now have information at our command that, advantageously applied, would permit huge numbers of citizens to live a healthy, hearty, alert full century. We now know how many can reach the 100-year milestone. The next question is—Why live so long? Do you or do I really want to stay alive that long? How long can a person really live? What is the proper time limit? Can we afford to grow older—as individuals, as families, as a nation? The standard threescore years and ten was recorded when the average length of life was scarcely thirty years. In the sixth chapter of Genesis, it is recorded that, even though man is mortal, "yet his days shall be an hundred and twenty years." These are intimate queries of first magnitude for each of us, and our future as a nation.

Certain priorities appear. We are aging on a wide front. The aging spectrum is a many colored, many splendored thing.

Research, Education and Application—these fundamentals determine our future. The health of our future depends upon our researchers today. Application of knowledge which pertains to us as living, feeling, striving individuals will fit us for our added years, which science is already making possible.

Accordingly, a stock-taking is indicated. Where do we stand in our thinking? Are current customs adequate to our needs as we face the future? Are present educational forms efficient in structure, content and personnel? A soul-searching appraisal, a critical evaluation of attitudes, practices and controls at the county, state and national levels is indicated. This survey should be made by qualified

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citizens who are versed in the many major fields concerned with human society, its growth, development, maturation and senescence.

This is the setting, the reason, and the need for the Conference on Aging.

It will clarify thinking if we shift our focus from the abstract, the anonymous and the impersonal to the immediate, individual, human approach. Thus the focus is not on aging, but on us as individuals, singly and collectively, growing and changing, hopefully for the better, as we age. Aging is a dual phenomenon. We grow and we age, and in specific ways we recede. These aspects should be observed. Influences and habits which encourage health, growth and enjoyable living should be promoted. Present-day practices and attitudes which limit human growth and flowering should be identified and when possible, corrected; one of the attitudes is the misconception regarding older citizens in their present unfortunate status as deficit members of our national family. There is need for a thorough catharsis of our present cultural mores that are inadequate and restrictive.

Changes occurring in man with the passage of time constitute the phenomena of aging. Comparison of the lifespan of man in primitive cultures in Biblical times, the lifespan one hundred years ago, and the lifespan today indicates that, with the advances of science, man is now enjoying a spectacular increase in the number of years he can live.

In enlightened communities where there is a high degree of awareness of the value of public health measures, sanitation, adequate nutrition, the control of disease through a modern public health program, and a generous supply of the services essential for enjoyable living, the span of years man can expect to live is now considerably beyond threescore and ten. However, in those areas of the world which contain the major portion of the population today—in the depths of Africa, India, China and to a certain extent, Russia and Japan—there are many communities that do not have the benefit from the magic of science. In these communities the length of time a human being may be expected to live just about approximates that of Biblical times—between twenty and twenty-five years. Thus science has proved its value to the human race in a most dramatic fashion.

What is science but the search for truth concerning man as a biologic mechanism, an emotional dynamo, an intellectual catalyst, a spiritual wonderer? When we evaluate and inspect this amazing human being in the light of modern knowledge and understanding, we find a remarkable individual.

It has been pointed out in the Report on Aging from North Carolina that there really is something new under the sun, namely, the population of our nation with more citizens over 65 years of age than at any previous time. When a nation has a high percentage of individuals living into the later years, it indicates in some way or another that the deteriorations and destructive forces which destroy human lives are being brought under control. We are living in a period of spectacular scientific advancement; significant new knowledge is in the making. Within the next decade or two, as understanding of the diseases that

destroy life is increased, and as medical science sets up procedures to eliminate one after another of these diseases, there will be a spectacular addition to the human lifespan.

This amazing change in human experience is taking place in a world which is rapidly decreasing in size. This is the result of the fantastic developments in transportation and communication. With the wizardry of transportation, one can lift the aborigines of primitive tribes out of the depths of Africa and transport them to Johannesburg, Madrid, Rome, Paris or New York in a matter of a few hours. These fellow human beings of different color and culture are quick to grasp the significance of the differences in living conditions of metropolitan centers compared with their own. The world is in a state of seething unrest in which primitive cultures are rubbing shoulders with advanced cultures where man is enjoying a high degree of human development and progress.

Civilization, so stated H. G. Wells, is a continuing race between education and catastrophe. Disaster hovers over society in three great ominous clouds; ignorance, poverty and disease. These widespread social disorders are the basis for the fears and degradation of man in his search for a more satisfying and meaningful existence.

The necessity for finding ways to control these degrading social ills is evident, and there is an air of immediacy due to the acceleration of communication and transportation.

POPULATION EXPLOSION

A group of scientists working under a grant from the National Institutes of Health (Bethesda, Md.) for the purpose of studying the increase in human population have determined that, if the world population continues to grow as it has in the last two thousand years, it will promptly annihilate itself by Friday, November 13, 2026. These mathematicians from the University of Illinois—Heinz von Forester, Patricia M. Mora and Lawrence W. Imot‡—state that whereas the optimists consider the growing population no problem because advances in food technology will provide sufficient food for all the world population, and whereas the pessimists believe that there is a limit, both optimists and pessimists are wrong. Based on the principle of adequate food technology, which has held true for 100 generations and can be predicted to last at least 3 more generations, our great-great-grandchildren will not starve to death, they literally will be squeezed to death. In other words, at the rate of increase in the population at the present time, with a marked limitation in deaths among the children and young adults, it may be predicted that a tremendous avalanche of humanity will occur in the next three-quarters of a century. Man literally is beginning to crowd himself off the earth.

Although the uninhabited areas of the world are rapidly shrinking in size, the family of man is increasing at a fantastic rate. A century ago, the first

‡ *Science* **32:** 129, 1960.

billion of human beings was reached. This took five thousand years to accomplish, whereas in the last century, from 1850 to 1950, another billion human beings was added. The third billion may join the others within the next century.

THE FABRIC

The social fabric is composed of families of persons of all ages. The extremely young and the elderly are controlled and manipulated by the energetic planning and appointment of the executive group in the middle years, aged 35 to 60. The young are the future executives and the old, being retired, are living in a hostile world. They have had their day.

The piecemeal approach to studying the qualities and needs of persons of different ages without any attempt to coordinate and fit them into an overall master program, or to take into account the inter-relationships, reciprocal influences and impacts of one group upon another, needs careful appraisal. A study of the components of one particular age group without relation to other groups of different ages, is bound to be restricted. Aging is a phenomenon which can be divided in terms of the entire lifespan into birth, growth, development, maturing and recession. There are qualities of expansion and recession at all ages in the phenomenon of aging. When attention is focused on the particular aspects of living during the later years, it becomes necessary to examine what has occurred in the years preceding arrival at the later period. Education about aging, the changes that occur biologically, emotionally, intellectually, sociologically and spiritually at all ages, then becomes a matter of factors—growth, development, maturation and recession.

Education, for older persons in particular, is a problem of evaluating criteria and the fundamental nature of human maturation.

Education by older persons implies a proposal for utilizing the knowledge, experience, understanding and wisdom of mature older members of the community in a more effective fashion in contributing to the broad cultural aspects of community and national existence.

RE-APPRAISAL

A re-appraisal of the nature and potentials of mature older citizens in today's world, then, constitutes the problem of aging and meaningful survival. In the modern world, highly charged by the new and fabulous revelations of vast physical powers existing in the universe, there is, as never before, a high priority placed on the conservation, development and utilization of the abilities, skills, knowledge and wisdom of older individuals in an endeavor to bring about a more stable, better balanced and richer national life. But in today's world, nations cannot be unattentive to international problems and relationships. The tremendous imbalance between the quality of living in the western nations compared with the quality of existence in the hinterlands of Africa, India, China, parts of Russia and the far Pacific creates the need for the utilization of vast numbers of mature, well educated persons, sensitive to the expanding needs of the world's vast, growing population. In truth, this is the setting, the

proper perspective, in which the White House Conference should approach the problems of human aging.

Education for aging, that is, growing into the mature period and later period of human existence, is related to every aspect of growth and development and must build on these foundations; it is a life-long learning discipline. Education for aging, that is, for living in a mature way, should influence community attitudes and actions with respect to the problems of growing old. There are many different kinds of organizations and agencies that must become involved in a well oriented, well integrated educational program for meaningful living in the mature and later years.

Accordingly then, let us face the fact that education for everyone about the fascinating problems of growing old should contribute in every way to personal growth and development, to an enrichment of family living resulting in informed public action with respect to problems of growth, maturation and recession. Older persons, as never before, need the opportunity for educational continuity so to enrich their lives that they, in turn, may influence the social structure, thereby creating a more vigorous democratic society. In fact, it would appear that more people are living long enough to arrive at a state of understanding human nature sufficiently well to bring about a satisfying way of life for all members of society, young and old, at home and abroad. Older individuals have much more to offer than younger ones in many ways, through education for bringing about a more satisfactory existence.

There should be a new image of the mature, educated, cultured citizen—an exciting image of the privilege of growing with life, of a new enthusiasm, a new zest, and a new reverence for life, love and human relationships. Unfortunately, the stereotyped and all too common image of old people is that of a group who are generally ineffective, stubborn, depressed, confused, useless, cantankerous and continually living in the past. Granted, a good many in the later years do reveal such attributes; many of them do so because, unwittingly, they live the image that they themselves have of others, still older.

The necessity for a thorough housecleaning of antiquated and outmoded mores of society is readily discernible.

One difficulty in thinking about education for the aging is the misconception that chronologic age is the principal measure of longevity. This is a totally inadequate concept. The passage of time affects people in different ways. Aging begins with the genetic endowment. The rate of aging changes per individual and is affected in many ways by environmental influences for better or for worse. Different parts of the body age at different rates. There are old persons in the their thirties and young ones in their nineties. It is possible to double the lifespan of lower animals. It is also possible in the human, with little effort, provided the individual himself is sufficiently motivated, to redirect habits of personal hygiene. If the person concerned will take the trouble to utilize information concerning a few bodily needs, nutrition, exercise, elimination, rest, recreation and general grooming, he will keep his body in good running order for many, many years.

It is now recognized by all students of aging that motivation plus morale is probably the single most important first factor which determines whether or not a person in the later years will live meaningfully or will become a vegetating, deteriorating organism. The time has come when sufficient knowledge is available to keep the exquisite human mechanism in splendid balance and good running condition. The individual, integrated into the stream of significant community life, is the best guarantee known for protecting himself against easily avoidable deteriorations that frequently appear in the middle years.

Through education, it is possible to produce a more dynamic, a more meaningful life for persons as they grow into the important years, the mature years. It is possible to conserve, develop, stimulate and utilize the talents of older citizens, and to give them a new self-respect, a new dignity for themselves, for their families and for their community. It is possible to increase the health and the satisfactions of life with the passage of time. It is possible to release the innate energy and increase the resources of human beings so that they will be able to make significant contributions to the society in which they live and, in that way, contribute a larger part to the national welfare.

ADULT GROWTH

Education for aging, a life-long challenge, should be an integral part of life's continuing experiences. There is a glorious new promise for individuals who live a life of continuing enthusiasm and growth. It is unfortunate so many people let their physical and mental faculties rest and rust for so long and then endeavor to stimulate themselves later, after their sixty-fifth birthday. Yet, there are numerous examples of persons who have not really been of much account to themselves or their families until the middle or later years; then suddenly they strike their stride and develop intellectually for the first time in their entire careers. This is a fortunate and happy surprise for others in their family. It is always a joy to see a friend arrive at a stage where he experiences more joy in living and exudes an unexpected power or a talent, previously dormant. Numerous researches have shown that people do not lose their intellectual powers as they grow older, even though they may function more slowly. Their physical prowess may lessen with aging, but the middle and later years do not require a high perfection of muscular power. Indeed, excessive muscular development may be somewhat of a hindrance to high intellectual attainment, provided the time spent arriving at such muscular perfection extracts time from more valuable intellectual pursuits that yield a longer, sustaining satisfaction. If older persons are sufficiently motivated to keep on learning, their accumulated knowledge and skills may more than compensate for small losses in speed, and their total accumulation of knowledge and understanding will, in any event, be superior to that of the total knowledge and experience of younger persons. There is, in truth, a mathematical proportion which appears to favor the position of the older, mature, wise citizen in the world of today and tomorrow.

Effective education for growing with the years must foster continued accumula-

tion of knowledge and thus promote purposeful living. Why should an individual live one hundred years or more if there is little joy and none of the fruits of a full and purposeful life, and if he has lost the enthusiasm, spirit, and joy of growth and attainment. In order to live meaningfully, older persons, in fact all persons, need to keep physically fit, emotionally disciplined and mentally alert, with a larger purpose in life than merely staying alive. This, as Hamlet pointed out, is not a child's task. It is the supreme challenge for education in modern times. Living in the metallic age, with silver in the hair and gold in the teeth, it is possible to avoid an excess accumulation of lead in the feet.

Since the dynamics of aging follow a dual process, expansion and recession, there is the possibility of increasing the values of life as time passes. There are the specific biologic, chemical phases of living, the dynamics of energy support and function; there are also intangible factors that are revealed in the display of various emotions, activities of the mind, and revelations of feeling in human relationships.

A highly motivated, unknown author has beautifully expressed the meaningful qualities of aging when he stated that, "Youth is not a time of life, it is a state of mind. It is a temper of the will, a quality of the imagination, a vigor of the emotions. Nobody grows old merely by living a number of years. People grow old only by deserting their ideals."

"Years wrinkle the skin, but to give up enthusiasm wrinkles the soul. Worry, doubt, self-disgust, fear and despair, these are the long, long years that bow the heart and turn the greening spirit back to dust. Whether 60 or 16, there is in every human being's heart the lure of wonder, the undaunted challenge of events, the unfailing childlike appetite for what next, and the joy of the game of living."

"We are as young as our self-confidence, as old as our fear, as young as our desire, as old as our despair."

BROADER HORIZONS

In order to learn more about aging, and education for aging, we must first attain an appreciation of the deep values of mature living, of those functions and necessities which encourage and enhance the better way of life and delay deterioration and withering of the spirit. More has been learned about the whole phenomenon of aging in the last decade than was known in all previous recorded history. It is probable that more will be learned about human growth, objectives and ideals in the next decade or two than has been discovered in all previous time.

The problem, then, of disseminating information pertinent to meaningful existence is the first challenge to education in this changing world. This becomes a pursuit of excellence in preparing for the future. A free society must identify, nurture and wisely use the talents of its people. It requires a glorious vision of individual liberty and dignity, on which the survival of the nation ultimately will depend. We are a nation with constantly changing frontiers. While our scientists are searching and exploring the far reaches of outer space, our biol-

ogists are exploring the recesses of inner man. And here is found an unsuspected world of great beauty, harmony, tremendous power and fabulous potentials for a better and finer way of living.

Education in our nation is now verging on a new era, a period of unexampled progress, of innovation, of vastly greater service to individuals and the nation as a whole, according to Wayne O. Reed. This great new development will depend upon vision and the ability to sense the conditions and need of the times, a willingness to be in league with the needs of the future. This is the time, as never before, for great vision, because from great vision may come a new greatness for our nation.

The quality of the work-world is going to change dramatically in the next decade. With automation, electronics and intellectronics such as never before suspected, new arrangements will be required which will place a tremendous demand on educational philosophy and specific training programs for the nation if we are to utilize and develop our best potentials. We are living in a time of tremendous, dramatic accelerated change. We are in the midst of a social revolution, the result of the present biologic revolution that is having an impact on the quality and vitality of human life. This improvement in the quality in individuals is bound to reflect itself in the quality of the social structures and in the cultures under which future man will live.

In order to come to grips with the major issues facing nations, it will be essential to inform ourselves of the finer details of the cultures existing in various far corners of the earth under which fellow human beings of different colors, cultures, creeds and ideas are living. For we are living in a shrinking "world," one vast neighborhood of troubled, tormented, insecure human beings. As never before, we are facing a period of tremendous change. As a nation, we may be on the edge of greatness. It then becomes paramount that young and old of all races, who are going to be the labor force in tomorrow's world, will obtain a better preparation than any former people. There will be a need for improved training, for wiser guidance and more wisdom in counselling. Obviously, there will be more competition for better jobs. A tremendous premium will be placed on training and ability to adapt to changing circumstances. As never before, there will be a high demand for responsibility in educational planning and leadership.

The decade of the sixties, according to Dr. Reed, will be the time when adult education becomes a substantial major part of public education. This phase of education is already growing at an amazing rate. Probably 30 million or more adults are now enrolled in some organized form of educational activity. In order to bring adult education to its full flower, it will be necessary to develop new and broader programs reaching into all parts of the nation. School boards and administrators will have to make bold plans in creative new departures to meet the educational demands of huge numbers of adult men and women.

For the first time, quality education for all members of society, regardless of status in the community, becomes a legitimate, acknowledged social objective. Reed has pointed out that we have already achieved an educational equality

which has made the United States the envy of the world. Yet, as Americans, we cannot afford to rest on these laurels, for in the making is a new and richer quality of living if leaders of society choose to recognize the potentials which science is uncovering. We must acknowledge that thus far in our national existence, we have set our goals far below our attainable objectives. We have seen through a glass darkly; there is now opportunity to see more clearly, to have a greater vision of a greater nation through a greater people. There is an opportunity to broaden and deepen the scope and the content of our educational philosophy. In the richest nation in the world, with its unprecedented material wealth, its great industrial productivity and its excellent national life, the greatest resource of the nation is in our citizens. In order to enrich the quality of living in the next half of the twentieth century, identification of justifiable goals is indicated.

Methods of training are being altered and improved. With new ways of stimulating the imagination of young and old alike by a new approach in creating images of worthy types as one grows into the middle and later years of life, the young will have a new vision of what they themselves may attain in the later years. Unfortunately, the current vision of the elderly is misleading and requires correction.

CREATIVE LEISURE

The problem of creative leisure will need to be studied, for work-related education is but one segment of our need. With higher standards of living and the new responsibility for citizens in today's challenging world, expanding leisure time will offer an opportunity, an unexcelled occasion for personal intellectual growth with broadening and deepening knowledge and understanding. This should be a basis in planning for adult education. In each child's life, a timetable should be set up for living a century-long lifetime of useful, happy and meaningful existence. In order to do this, it will be necessary to revise current attitudes toward aging.

KEYS TO RICHER LIVING

There are certain key factors in planning a broadened adult educational program. First of all, the key to entering a new and more wonderful life in the mature years is a corps of mature teachers who have, themselves, the vision of what man may be. This attitude and understanding should be based on a thorough knowledge of the potentials inherent in the human body, nervous system, and spirit. The teachers, then, must derive from the older, senior-citizen group of our population. Only they are the ones who, by accumulated knowledge, understanding, experience and wisdom, will be able to paint a new word-picture of the glories to which the human individual is heir. Quality, then, of a high degree in the teaching profession is a first requirement. One will not necessarily find the ablest teachers for long life in the younger members of the teaching profession. There should be the high and honorable estate

of the senior counselors, those who know the fabric of the body and mind as it may attain a newer excellence at the summit of the years.

GERMINAL CENTERS

In addition to an imaginative teaching corps, there is need for a wider utilization of the schools and libraries of the nation. Time for growth requires tools for study. The occasion is instant; experiments are not particularly perilous, but they do demand application, sincerity, and an emotional dynamism which will uncover hidden resources that will be a joy to behold. In the libraries of our land, practically every community has a reasonably satisfactory store of volumes. The literature is increasing, although there is a need for a different and more positive kind of reference volume that will more clearly delineate the current practices that must be developed, and current modes of living that are to be encouraged in order to enhance a richer culture for our aging population.

An exciting fact is that new knowledge of first importance is in the making—knowledge which you and I and our co-citizens cannot affort to ignore. On a wide research front, convincing data concerning the deep values of rich and meaningful living in the summit years are now accumulating at flood tide.

Classification by experts is indicated. Primary goals need to be identified; then, by an inspired teaching program, dissemination should spread this rich, fertile news to all areas of each community in our nation. The time is now. The future is in our hands. Survival depends upon an informed, enlightened, alert public. Key leadership from our educators needs intimate cooperation from parents and community representatives, schools, libraries, and civic and professional groups. Community libraries are a most valuable germinal center from which recent acquisitions in the form of reports, bulletins, books, and magazines of all kinds can be distributed. Libraries are a rallying headquarters for the community. Their real worth has but to be discovered. We can no longer fail to support them, as the public is now awakening to the need for additional information with which each citizen may reach a more enjoyable, healthy, longer life, free of many nuisances.

The word "education" derives from the Latin "educo," to lead out. It implies an action resulting in a higher level of understanding. Accordingly, if one continues his education, he continues to move upward. The opposite is illiteracy and ignorance. Education for aging, for a continual search, a leading outward and upward: Is not this the formula for building a better way of life? The home, the school, the library, the church; these are the germinal, the resource centers for our upward journey through life. Aging, then, conditioned by a philosophy of life-long education, may establish a new timetable for reaching maturity. To live victoriously, triumphantly, with zest and enthusiasm for new adventures—here is the essence of the full life. Human beings with such a life-plan will brush aside the pettiness, small jealousies and selfish strictures which are qualities of arrested growth, of small minds. To be very much alive is to become very human, and to become very human is to be very much alive. To live with the immortals of great literature, great music, great science, or great religion, this

is each human being's sovereign birthright. Here in the realm of the intellect, fine emotions and spirit, one's great capacity for growth is attained. Our social instruments, schools, libraries and churches have great potentials. New information and materials are accumulating. It remains to energize, to galvanize local communities into a dynamic educational program that will assist all of us to grow with each new day.

Rose Vainstein in a brilliant article, "The Role of the Public Library in Education for the Aging," states, "Statisticians have estimated the annual dollar loss from the common cold, from industrial accidents, from air pollution, from crime and many other things we could well do without. But who has reckoned the cost of ignorance? The task for public libraries lies ahead. With various community agencies working together on the educational implications of aging, with increased community awareness as to the issues involved, the public libraries of our nation—so aptly called a 'peoples' university'—can contribute as substantially to the field of aging as they have done in other areas of community service."

METHODS

Reed points out that there is a great shortage of teachers and perhaps classrooms. Nevertheless, there are new methods of communication, such as radio, television and audio methods of remarkable excellence. High-fidelity records are now being made of talks by distinguished authorities in all of the various exciting aspects of human existence. In the final analysis, the greatest explorations will not come from flying in outer space, but rather in a keener appreciation and understanding of the rich emotional relationships and intellectual explorations that are boundless in their potential for a new and finer way of life.

Where there is a will, a desire, methods can be developed. With the use of stimulating teachers on television programs, the making of records and the distribution of illustrative material, the technical essentials are already available. It only remains to have the leaders in various communities acknowledge that a new and finer way of life is possible with the attainment of years of knowledge, experience and wisdom. When leadership at the national and community level accepts the responsibility for developing new ways and opening up new pathways to higher attainment and richer experiences, then, as a people, we shall be on our way to attaining the position for which all of us yearn. As Shakespeare has outlined in "Julius Caesar"—"The fault, dear Brutus, lies not in our stars but in ourselves that we are underlings."

Quality education for everyone will depend on school boards and community leaders accepting the responsibility for bringing about a new kind of organization which will have as its major objective not only the training of the youth and young adults of the land but, equally important, the continued training of older persons for ways to a happier later life. Our dynamic growth as a nation is not only in the riches that our industrial productivity can create, but in the flowering of the human intellect.

With electronics and automation reducing heavy toil so that the mechanics

of industry can be handled by a skillful few, more persons will turn from production to service areas for livelihood. Here, too, is a new field. There are vast numbers of fellow-beings in the far places of the world who have not, as yet, attained even the first desirable tools for daily living; even primary schooling is absent. A huge amount of work is essential to eliminate the darkness which still envelops millions in the world neighborhood.

ADULT EDUCATION IN THE NUCLEAR AGE

The vast fund of new knowledge is only going to be utilized when leaders in education direct attention to classifying this information and preparing it for presentation to the public. With the new methods of training, it will be easier to have wide dissemination of information. Specialists will find it necessary to share their information with distinguished thinkers in other areas in order that the corps of teachers will have a fund of knowledge that can be presented in orderly and attractive fashion. It must ever be kept in mind that the information available a decade ago is totally inadequate to the needs of the nuclear age. One may ask, is our educational program for the nation adequate to the demands of the aero-space age? Are we planning adequately, and with sufficient imagination for an entirely new social existence? Human dimensions are expanding not only into outer space but into the inner recesses of man. Reed uses the phrase, "a world of intellectronics," which he borrows from Dr. Simon Ramo—a world in which electronic machines will be the extension of man's intellect in somewhat the same way that his first crude iron-age tools were the extension of his hands. The imminence of this world of intellectronics and its fantastic novelty have important implications for leaders in education. As Reed states, no one can understand such a world unless he is prepared. No individual can make the most out of the great potentials of living a mature human life unless he prepares for it. The unprepared man is too great a hazard. If he chooses to recede from life, life will recede from him. He cannot attain wisdom merely by existing. There must be the desire, the objective, the motivation to arrive at a higher plane of personal excellence with the development of richer bonds with his fellow man.

STUDY PERIODS

These are new concepts for the new world in the second half of the twentieth century. I believe that for the younger on-coming citizens there should be a ten-month rather than an eight-month school year; there should be opportunities for study the year round. Obviously, this will require a vast increase in the number of teachers. This will come when we, as a people, acknowledge that our first great needs are in the realm of education. Victor Hugo made the observation that nothing in the world is so powerful as an idea whose time has come. Now is the time, if ever, that education for longer life has arrived. There can be no alternative. If we are willing to accept a second-class dole type of existence, resting on past laurels, modest in degree but in no ways measurable to our majestic potentials, we may exist; but our fellow citizens will have to take care of many of us.

The fundamental concepts on which the United States and our life as a nation were based were not those of second-class citizens. The signers of our Declaration of Independence recognized the sovereignty of the individual; the state was the means of assisting people to a more productive, more satisfying existence. Our old philosophies and truths are not faulty; they need be reapplied, broadened and deepened. Now is not the time to chase false philosophies in an endeavor to make life easier.

In its best essence, living in any age is not an easy experience. Resting on past accomplishments with no interest in the future is deadening. When this principle is accepted, then is the time to re-examine the curriculum of our primary schools and develop a new curriculum that will take advantage of the vast amount of knowledge now available which is of interest and importance to our older population. This is timely, for failure to solve the curricular problem, as Reed states, may have grave consequences for our nation. If, because of lack of vision, we fail to prepare for a world which makes unprecedented demands for the prepared man, it is probable that a new dualism may appear. On the one hand, there will be the educated, the elite, with understanding and wisdom; this will be a sophistocated minor group able to shape the new world they envision. On the other hand, there will be the majority of individuals who because of lack of interest, vision and imagination will be living as second-class citizens, unable to participate in the greater world above them, intellectually speaking.

RESEARCH IN EDUCATION

With new methods not yet tried on a sufficiently large scale, the opportunity for setting up different kinds of experiments in teaching is attractive. This will include an organizational activity involving school administrators, librarians, teachers, teachers' aides, school boards, and officials of community, state and national governments in the field of education. Development of new methods for inter-communication between different groups and the trial of various recently discovered ways for communication need to be explored. Most of all, there should be a greater speed in classifying the new knowledge and new ideas into usable realities that can be applied in everyday teaching.

The germinal centers for self-education are, first the family, the schools, the churches, the great centers of learning in the universities, research institutes and, by no means last, the hospitals of the nation.

In the creation of an intellectual atmosphere that will stimulate thinking in young and old, there is high merit. The zest of life is always at the growing edge, and growth is not a sole possession of the young. Growth at the mature adult and later year periods may have an emotional richness that the young can never know. It was Browning who issued the invitation,

> "Grow old along with me, the best is yet to be
> The last of life for which the first was made;
> Our times are in His hands who sayeth, 'A whole I planned.'
> Youth knows but half
> See all, trust God nor be afraid."

And Longfellow had the vision to see it when he observed that, "Age has its opportunity no less than youth itself, though in a different dress; and as the evening twilight fades away, the sky is filled with stars invisible by day." The richest period of life is in the mature years.

Failure of our educational program is very evident in the widespread social disorders of our day; first, juvenile delinquency and second, disrespect and dishonor of the elderly. Where family bonds are weakened, where there is a lack of integrity and warm emotional glow within the family, there lie the seeds of dissatisfaction, waywardness and indifference to means for getting the most out of life.

Quality of life arises, first of all, within the circle of the family. It is enhanced by the school, the church and our advanced educational institutions. With wide dissemination of tremendously important new knowledge that is accruing, the utilization of this in effective ways will be our open door to a finer national life. With vision, creative imagination and intellectual daring, we ourselves may, by our common effort, arrive at a way of life that in former days would have been regarded as wholely visionary. Education in its finest essence is an invitation to exciting new experiences, to continue the growth of emotional and intellectual life and the life of the spirit. To taste the best of life, one must drink deeply and progress from the physical senses to the spirit. It is a matter of becoming more and more the best of one's self, and the best of our combined selves as a strong nation.

Beyond the physical and the mechanical, there is the realm of the intellect and the spirit. Here is where the practical and the material meet the things of the spirit, the divine, the enduring. Here religion and science become the common goal of modern man. Faith, curiosity and discipline are common to the bases of science and religion. Although there are differences between the two, they meet at the apex. Religion may concern itself primarily with the goals and values of life, whereas science deals primarily with the physical facts and methods; however, there is an inescapable interdependence, and no rigid barriers can be erected between the two. Religion speaks eloquently about the dignity and value of the individual; we can learn much from the way science acts concretely in examining him. Medicine can well say to religion, as Liebman has pointed out, "Beware of the arteriosclerosis of dogma and the dangerous bacteria of sectarian pride."

Science and Religion, therefore, are great intellectual tools of modern man in his search for a finer, better way of life. Never before has society had such a clear and engaging opportunity to search for a means to appreciate and know a new and finer reverence for life.

Life should be an unfolding, blossoming, ripening, maturing experience.

The rosebud is beautiful in its small perfection; but the full blown rose has known the wintry blast, the play of the wind, the surprise of the rain, the warmth and richness of the summer sun. The full bloom yields its magical beauty and gives the world its final perfection.

Ralph Waldo Emerson viewed 60 years of age thus:

> "Spring still makes spring in the mind
> When sixty years are told
> Love wakes anew this throbbing heart
> And we are never old.
> Over the winter glaciers I see the summer glow
> And through the wild, piled snowdrifts
> The warm rosebud below."

We are standing at the dawn of a new day. As we have vision and understanding to see the potentials of modern man, we shall, as a nation, develop the methods to utilize the immense resources which the Almighty has placed in our hands to bring about a more satisfying, richer and more meaningful way of life.

LIFE SCIENCE

Charles W. Eliot, one of the great educational leaders of our nation, made the statement when president of Harvard, "The human race has more and greater benefit to expect from the successful cultivation of the sciences which deal with living things than with all the other sciences put together." There are greater benefits which depend upon the utilization of knowledge that science has produced for our schools. Life Science has become increasingly, not only a great treasury of vitally important information, but an interpreter of man and a way to learn how men may live together. The greatest benefits Life Science offers man, particularly in a democracy, may be attained only when its basic principles and methods have become the possession of the average citizen. Science has equipped us, so the writer Joad states, with powers fit for the Gods and we bring to their use the mentality of babes and schoolboys. The mathematician and astronomer, Moulton, once stated, "If Science is to be made to realize its possibilities in the advance of civilization, then it must become an essential part of the intellectual life of the average man, for in the long run, the masses determine the rate of progress." Hooton, the famous anthropologist, observed, "I believe that the application of biological science to man is the single means of salvation of our species."

Life Science is in the position of emphasizing the newness of intimate knowledge about ourselves, for nearly all the definite and worthwhile information that we have about our own bodies has been learned since the turn of the century. We are indeed living in a period of biologic and sociologic revolution. In order to make the most of this, it is necessary to get the basic facts, start from the foundation and build a new kind of educational program. When democracy as a philosophy of government is under destructive attack, the only means for our survival, meaningful survival, is to utilize the benefits of modern knowledge in bringing about a stronger and more vibrant citizen.

EDUCATIONAL DARKNESS AND LUMINOUS RESEARCH

Oscar Riddle, the distinguished biologist, speaking before The Lankenau Hospital Cancer Forum in Philadelphia in November 1937, made the observa-

tion that since the turn of the century the natural sciences have provided the knowledge and the principles that are capable of completely revolutionizing earlier theories concerning the nature and destiny of man. Nevertheless, as emphasized by Riddle, despite the surprising fruitfulness of scientific research, it may well be that when future generations look back and form an appraisal of present mid-twentieth century man, they will marvel less at the brilliant accomplishments of research than at the depths of our present educational darkness, less at the intellectual achievements of a century of science which has uncovered the basic facts concerning man's nature and his place in nature than at the present educational programs which fail to grasp the significance of the new truths and the principles as presented to the oncoming youth of the nation. It is in the area of biology, the Life Sciences, that educational darkness is so flagrant and conspicuous. The truth and the principles of this same group of sciences, the Life Sciences, might otherwise contribute greatly to the mental and physical well-being of present and oncoming generations of man.

The primary and secondary schools of the nation have a unique opportunity to train the mass of young and old in the basic theories and principles of Living Science. These schools, according to Oscar Riddle, form the only broad path to the solid, fundamental education of the people. Prior to any other theory is the fact that man is a physical, dynamic, living, progressing, developing human being. Society is made up of a congregation of young and old, living, changing, aging human beings. All elements of society participate knowingly or unknowingly in this changing, seething mass of humanity.

We have broken with the intellectual tradition of the past, as emphasized by John Dewey, the philosopher-educator of a quarter century ago; however, the nature and significance of the changes in the vast amount of knowledge available and in teaching methods have not been interpreted to the mass of citizens. The field of education is immense, and has many facets. The training of young and old to derive the best of current knowledge for directing their lives is not yet recognized as a legitimate and practical major objective of society. This training is essential to the development of a curriculum (particularly for the early school years) that will instill in the minds of the young a point of view, a mental attitude, that will keep the channels of their receptor mechanisms broadly open and responsive to the instruction which should be directed by qualified leaders in education. This is a field that has been virtually untouched. It is generally recognized that the most fundamental attitudes are formed in childhood, but with age these, too, may be altered and augmented. Little attention has been given to instilling, as a part of the learning process, a trust in intelligence and an eager interest in the encouragement of the inquiring mind.

The spectacular accomplishments in the physical sciences and their subsequent contributions to industrial methods have produced a unique evolution in the creation of entirely new materials. In the realm of chemistry it is now known that basic elements may be changed to other elements by the use of the atomic generator. It is of even greater value to society, when the Life Sciences can be introduced into the broad general program of adult education to fit the

middle-aged and older persons, to equip them so that they will be able to realize their untapped resources. When the principles of learning have been established in the early years (it is recognized that the science of human development and maturation can present the basic facts concerning the growth and expansion of individual knowledge), a solid foundation will then have been established as a philosophic principle of continuing education. Such simple but important truths as the gradual origin by descent, with modification of complex life including man himself, and the kinship of all living things aid in orienting the student body. In the center of the great stream of human living, there is the principle of progress within ourselves; it is a crowning fact that, of nearly 2 million living species in the world, it is Man that has been lifted most, that mankind is now the moving point on the wave of life. Life Science introduces important facts of genetics, the momentous principles of inheritance. It includes a study of why offspring find in themselves the same characteristics noted in their ancestors. Genetics includes consideration of the differences or variation among offspring. In this study, the utilization of these principles in the improvement of individuals and races of plants and animals is experimentally approached. Knowledge derived from animal and plant experimentation, provides much of interest and importance to human improvement. Life Science emphasizes the plasticity, that is, the modifiability, of the growing individual even though the initial hereditary inequalities cannot be entirely erased, as emphasized by Riddle. Living science, in much the same manner by which it has gained control over many diseases, is now making important beginnings in controlling the growth and attainments of plants, animals and man himself. We have now attained a position in educational progress where it is possible to see a world of wonder and beauty unfolding before us. This now becomes a realizable objective; such a statement is not the result of mere daydreaming, caprice, or magic or wishful thinking. The future citizen may be a vastly improved product over our forefathers and over ourselves, provided modern man, you and I today, grasp the significance of the dynamic changes that are occurring and the important fundamental fact that now we have the knowledge to direct our own destiny.

Through this knowledge, we are able to gain a new understanding of ourselves, of our structure and function, and of the means to bring about a more vital and rugged existence.

Recognizing the necessity for maintaining a healthy, streamlined, responsive, strong body is the first necessity in enjoying a rich and meaningful long life. Subsequent, and closely interrelated, is the necessity for accepting the primacy of the mind as the measure of the individual. As we think, so we are. This, then, becomes a matter of consideration of the goals and the objectives that we as individuals and as a social group value most. Motivation is determined by values and the incentive to strive, to extend ourselves; to attain our goals becomes a central fact in planning an educational program.

The seething unrest, the turbulence, currents and cross-currents in the world today offer an unexcelled opportunity; in fact, demand a clarification of the methods and practices of our society. In a discussion of the popularization

of science by Jean Rostand, he emphasizes that science needs to have its methods understood by the broad mass of people. When the public recognizes the importance of present knowledge and its bearing on their ability to reach a better and more satisfying existence in the middle and later years, this in itself will act as a strong incentive for the creation and maintenance of a broad educational program. Rostand points out that, with indoctrination of the minds of the young, the middle-aged and the old in the significant new knowledge that is daily being compiled, each individual in possession of this knowledge may freely build his own small universe.

Any distinction between the man of science and the ordinary man is no longer accepted, any more than a form of segregation based on an inequality of knowledge. Whether we like it or not, the laboratory henceforth opens right onto the street. For science not only has its impact on our lives at any given time in our day-to-day living, it follows and pursues us. We are governed and controlled by the laws of nature. We are involuntary experimental animals—guinea pigs as it were. The atomic bomb was exploded and particles of radiation materials became a part of our bodies, being lodged in our bones.

Rostand makes the comment that the obligation to endure gives us the right to know. Accordingly, the time has arrived when the average citizen should, by virtue of a high quality of training and accumulation of knowledge, that is, education, be able to contribute a more effective role in shaping the great social and economic, national and international programs that are necessary if we, as a society, are to endure. There has always been the challenge to endure in times of great crisis. Nations have risen, prospered and fallen in the past.

That we may be at the apex of a period of flowering and great wealth in external and material possessions will not guarantee our future as a nation. The supreme test will depend upon what we hold high and noble, and for what we are willing to give our lives—in other words, our most deeply held values. When a mode of life, however outwardly successful, leads to inward distress, denial or decay, the radiance of an age of greatness may be quickly dimmed, as pointed out by Haskins.

Haskins identifies three anchor points in the philosophy of modern society which stand out with special prominence. He identifies the first of these major items as primary dedication to the individual and to his creativeness—that overriding commitment which impels all to see the stature of the nation primarily as a function of the welfare and perfect realization of the worth and the stature of the individual. On this depends the fundamental orientation and integrity of modern society, which is its modern justification for existence. Closely linked to this, Haskins emphasizes, is our basically religious culture. We are accustomed to identify a strong drive for individual accomplishment and achievement with the Calvinist tradition that has been handed down from early New England cultural and spiritual forebears. A large share of this energy momentum has nonmaterialistic roots.

A third well-spring of current national life is our deep respect and concern for learning, exploration and innovation. This is particularly true in the area

of great leadership in science, with exploration of nature and the universe in which we live. We have been a creative, a technically creative nation. The world has derived vast material benefits and now we find ourselves as the "master banker" for the rest of the world, a not too enviable position in economic circles.

Spectacular advances in the knowledge of nuclear energy are but a further extension of science's evaluation of natural law and processes. In this rapidly expanding field, there is a relatively small group of highly qualified, motivated, well trained workers who are widening the gulf between themselves, the intellectualists, and the non-scientists, the broad mass of the public. This is an important divergence. Society must be sufficiently resourceful to find ways and means to grasp the significance of the work our trailblazers are carrying on. It is vital that the scientific discipline should be recognized as truly creative and as research in the best sense, rather than as merely technically essential for the production of more material things. Science in its search to understand more and more of the ways of nature is not concerned particularly with the creation of new material things but, rather, with a broader and deeper understanding of the meaning of the ways in which nature expresses itself.

In this momentous period of significant biologic and sociologic transition, education is the keynote, the master word, the open door to progress for society in the next half century. Education about aging in reality is education for growing with the years, and should assist people not only to understand how others age but, more central to the fact, how we ourselves should meet the changes within ourselves with passing time. Each of us, then, has the obligation to know how to care for this amazing mechanism, the human body. Each of us, should sense the obligation of maintaining bonds with family, friends and colleagues in an expanding program for our own lives and for the society in which we live. First of all there should be a definition of worthwhile goals for which we are willing to strive and extend ourselves. When we stop growing, we stop progressing. Maturation—becoming mature—is a delicate balance between growth and recession with, hopefully, the balance tipping in favor of the growth process as it involves our emotional, intellectual, social and spiritual being.

SOCIAL SCIENCE

Since the last World War, concentration of attention in education has been directed to extension of our educational program in the realm of the physical sciences, emphasizing mathematics, physics, and their related subjects. This is as it should be, but there is a neglected area that now must be accepted and clarified, namely, the area of the Social Sciences.

Julian Huxley in his essay, "The Future of Man," which was published in the Bulletin of The Atomic Scientist for December 1959, pointed out that the new humanism, that is, the new science of recognizing the intangible values of social man, is in its infancy. We are at the time when social man is a central object for experimentaion.

Down through the ages, there have been great leaders of men who by example,

precept and statement have been able to make a permanent impact on struggling society. Chief among these have been the great religious leaders. It might be stated that Jesus of Nazareth and Saint Francis of Assisi were two of the greatest social scientists man has ever known. Their knowledge of moral and ethical relationships, upon which an enduring society must be founded, has been sufficient to inspire ageless endeavor for struggling humanity to reach, meet, and attain a higher way of life. Although there is much in their sayings that is allegorical and not understandable to our limited minds, there are, nevertheless, basic truths that represent the hope of millions for a better and a more satisfying existence. It is only as individuals attain a certain knowledge of understanding, experience and inner feeling that these great precepts may be completely understood. St. Francis expressed it so:

> "Lord, make me an instrument of Thy peace. Where there is hatred, Let me sow Love. Where there is doubt, Faith. Where there is despair, Hope. Where there is darkness, Light. Where there is sadness, Let me sow Joy. O divine Master, grant that I may not so much seek to be consoled, As to console, To be understood, As to understand, To be loved, As to love. For it is in giving that we receive; It is in pardoning, that we are pardon'd; And it is in dying, that we are born to eternal life."

CHOLESTEREMIA OF RABBITS FED CARBOHYDRATE DIETS*

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During the past decades much attention has been paid to the role of lipids, especially cholesterol, in atherogenesis. Only in recent years has it been pointed out that the blood cholesterol level is influenced not only by dietary lipids but also by dietary proteins and carbohydrates. The number of references to carbohydrates affecting blood cholesterol and lipoproteins is still limited.

Portman and co-workers (1) observed that the blood cholesterol level of 4 cebus monkeys decreased when dietary sucrose was replaced by corn starch, but increased when sucrose was substituted for starch. Cheng-Chun and Herman (2) noted a twofold to threefold rise in the concentration of blood cholesterol and a tenfold rise of liver cholesterol in rats fed a diet containing 15 per cent sucrose. Grant and Fahrenbach (3) fed sucrose and glucose monohydrate to a series of chicks: blood cholesterol levels were similar. On addition of cholesterol to these diets, birds fed sucrose had blood cholesterol levels twice those of birds fed glucose. Later, these authors (4) modified and expanded their experiments, with little change in results. In a series of rabbits fed for sixty days with a diet containing 50 per cent sugar, the average concentration of blood cholesterol was 1015 mg. per 100 ml. after glucose feeding, and 1539 mg. per 100 ml. after sucrose feeding. Nath and associates (5) found that diets containing sucrose, dextrin or anhydrous glucose caused similar degrees of hypercholesteremia.

Adams *et al.* (6) observed hypercholesteremia in rats fed glucose. Van Handel and Zilversmit (7) stated that rabbits fed a sucrose diet exhibited lower serum cholesterol levels than rabbits fed liquid oil, hydrogenated oil or wheat germ oil. Wells and Cooper (8) reported absorption of 40.4 per cent of cholesterol administered to rats fed sucrose, and 66.2 per cent absorption when rats were fed lactose instead of sucrose.

Attempts to explain these divergent observations resulted in several new experimental designs. Kritchevsky and co-workers (9) investigated the effect of sugars on the turnover of cholesterol-4-C^{14} in chickens, and concluded that glucose is utilized faster than sucrose. Addition of chlortetracycline to the diet caused an increase of blood cholesterol in glucose-fed birds to the level observed in sucrose-fed birds, but did not alter the level in chickens fed a sucrose diet.

Portman *et al.* (10) implicated cholate in the hypercholesteremic action of carbohydrates. In rats fed corn starch or sucrose alone, blood cholesterol concentrations averaged 106 mg. and 124 mg. per 100 ml., respectively; with cholate added, the corresponding figures were 257 mg. and 378 mg. per 100 ml. Glucose

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and cholate caused blood cholesterol concentration to rise to 361 mg. per 100 ml., and fructose and cholate resulted in a level of 411 mg. per 100 ml. These diets also contained 8 per cent of corn oil. According to Filios and co-workers (11), after hypercholesteremia had been induced in rats by a diet of sucrose, corn starch and cholate, a short-term change to a starch diet resulted in a reduction of the blood cholesterol level, but prolonged starch feeding had no effect. Adams *et al.* (6) failed to observe any decrease in the concentration of blood cholesterol in rats fed a starch diet.

Since these observations lack uniformity, and explanation of experimental results is not satisfactory, a broad study of carbohydrate diets in rabbits was undertaken.

MATERIALS AND METHODS

White buck rabbits of a New Zealand breed were used. Their average weight was 1500 Gm., with ±20-Gm. variation. In the first trial, 10 rabbits were used in each of the 30 series of the study. Since the observations contradicted reports of many investigators who studied the influence of carbohydrates on the blood cholesterol level, the whole study was repeated during a second year and again during a third year, each time using the same total number of animals.

The arrangement of the experiment was as follows:

Series	First Feeding Period (2 wks.)	Second Feeding Period (2 wks.)	Third Feeding Period (4 wks.)
I	Basal diet	Basal diet	Basal diet
II	Cholesterol	Basal diet	Basal diet
III*	Carbohydrates	Basal diet	Basal diet
IV*	Cholesterol	Carbohydrates	Basal diet
V*	Cholesterol and carbohydrates	Basal diet	Basal diet
VI*	Cholesterol and carbohydrates	Carbohydrates	Basal diet

* Series III–VI each contained 7 carbohydrate groups—dextrose, fructose, maltose, sucrose, rice, corn starch, and potato starch. The basal diet was Purina rabbit chow.

Cholesterol (powder, Merck) was fed in a daily dose of 2 Gm. The carbohydrates were each fed in a daily amount of 20 grams. Dextrose (anhydrous powder, Baker), fructose (powder, Eastman Organic Chemicals), maltose (powder, Matheson, Coleman & Bell), sucrose (crystals, Baker), rice (white, uncoated, Sultana brand, A&P), corn starch (Knighthood brand, Reeves, Parvin & Co.), and potato starch (Samuel Zuckerman & Co., Philadelphia, Pa.) were used. Sugars were dissolved, and other substances were suspended in water. The water was poured over 20 Gm. of rabbit chow (pellets, Purina) and the pellets were dried. Rice was mixed with the pellets. Only after we had made sure that all the treated feed had been consumed were the rabbits given additional chow without restriction.

Blood was drawn prior to the experimental diet, after the first two-week feeding period, after the second two-week feeding period, and four more times at weekly intervals while the rabbits were fed chow only. All blood samples were analyzed for total cholesterol, total protein, glucose, and urea nitrogen. The Autoanalyzer (Technicon Co.) was used for these assays. The animals were weighed before the start of the study, after two and four weeks, and at the end of the observation period. Autopsies were performed. The liver was weighed and liver cholesterol was determined. The aorta was grossly stained with Oil Red O and then processed for microscopic examination.

OBSERVATIONS

The rabbits consumed the diets reluctantly. Rice disappeared from the feeding dish faster than other carbohydrates. After two to three days the animals got used to the sugar-coated pellets and ate better. They never became used to the starches and many stubborn, starving rabbits had to be replaced by more cooperative animals. Cholesterol was consumed fairly readily and its addition to carbohydrate diets did not influence food consumption.

Rabbits with abnormal blood cholesterol values were replaced, in order to establish a uniform population. In the total study, the extremes for the initial blood cholesterol values were 81 and 110 mg. per 100 ml., but 90 per cent of all values were between 85 and 104 mg., and 86 per cent were between 91 and 99 mg. The average was 94 mg. per 100 ml. To facilitate evaluation of results, all pre-experimental levels were increased to 100 mg. per 100 ml. and all subsequent values were proportioned accordingly.

The average pre-experimental glucose level was 85 mg. per 100 ml. of blood, with a range of 81 to 107 mg. Total serum protein ranged from 5.1 to 6.3 Gm. per 100 ml., with an average of 5.72 Gm. Blood urea nitrogen ranged from 9 to 13 mg. per 100 ml., with an average of 12 mg.

All rabbits gained weight during the eight-week observation period. Rabbits fed sucrose gained least—215 Gm. on the average. Rabbits fed corn or potato starch gained most—1,000 Gm. on the average. The average weight gain for the other series was 650 Gm.; the animals fed maltose gained more weight than others.

The weight of the liver increased in all animals fed cholesterol, and more so in rabbits fed cholesterol and carbohydrates. The increase in liver weight paralleled the increase in liver cholesterol. Compared with normal controls (Series I), the liver cholesterol of rabbits fed cholesterol (Series II) was 30 per cent higher, and the liver cholesterol of rabbits fed carbohydrates at any time (Series III–VI) was, on the average, 40 times higher.

Aortic atherosclerotic plaques were not found in rabbits whose blood cholesterol level was less than 400 mg. per 100 ml. In animals with higher blood cholesterol levels, the number of patches roughly paralleled the degree and duration of hypercholesteremia.

The concentration of blood sugar was not influenced by the various diets. Fluctuations were within normal limits. In rabbits receiving cholesterol and carbohydrates for the first two weeks, carbohydrates for the next two weeks and chow for the following four weeks (Series VI), the blood urea nitrogen level was elevated during the fourth and fifth weeks of the period. It increased up to 21 mg. per 100 ml. but declined along with the cholesterol level.

In all but the control series (Series I), the serum total protein curve paralleled the blood cholesterol curve. At the peak, protein concentration ranged between 7.5 and 8.8 Gm. per 100 ml. reflecting the height of the cholesterol concentration.

Detailed tabulating of chemical results seems superfluous, except for the

TABLE 1

Blood Total Cholesterol Levels (mg. per 100 ml.) in Rabbits Before and During Experimental Diets

SERIES	REGIMEN		INITIAL LEVEL	AFTER 2 WEEKS	AFTER 4 WEEKS	AFTER 5 WEEKS	AFTER 6 WEEKS	AFTER 7 WEEKS	AFTER 8 WEEKS
I	8 WEEKS, B		100	105	100	98	97	101	100
II	2 WEEKS, CH 6 " B		100	512	397	267	99	101	103
III	2 WEEKS, CBH * 6 " B		100	99	95	100	106	100	101
IV	2 WEEKS, CH 2 " CBH 4 " B								
		D	100	510	333	192	132	81	105
		F	100	540	375	350	225	105	120
		M	100	500	472	357	240	158	115
		S	100	503	245	235	230	220	110
		R	100	451	233	169	175	127	102
		C	100	478	324	244	202	151	130
		P	100	419	211	243	227	176	131
V	2 WEEKS, CH +CBH 6 " B								
		D	100	308	311	290	203	137	101
		F	100	243	336	300	222	200	103
		M	100	390	328	281	227	172	140
		S	100	207	238	175	165	100	102
		R	100	286	238	127	105	100	102
		C	100	701	618	418	211	215	165
		P	100	513	466	295	137	113	103
VI	2 WEEKS, CH +CBH 2 " CBH 4 " B								
		D	100	568	670	515	302	220	115
		F	100	500	193	220	200	165	150
		M	100	375	298	217	150	110	100
		S	100	302	201	132	127	89	98
		R	100	514	640	587	421	325	131
		C	100	645	850	710	535	430	275
		P	100	612	730	595	538	405	306

* D,F,M,S,R,C,P

DIETS ... B ... BASAL DIET
CH ... CHOLESTEROL
CBH ... CARBOHYDRATES

D ... DEXTROSE,
F ... FRUCTOSE,
M ... MALTOSE,
S ... SUCROSE,

R ... RICE,
C ... CORN STARCH,
P ... POTATO STARCH

cholesterol determinations. Average blood cholesterol levels are presented in Table 1 and in Figure 1. Each value in the table represents the average of 30 determinations.

BLOOD CHOLESTEROL DATA

Series I. Blood cholesterol concentration remained within the normal range throughout the eight-week observation period. When plotted, the averages lay almost on a straight line.

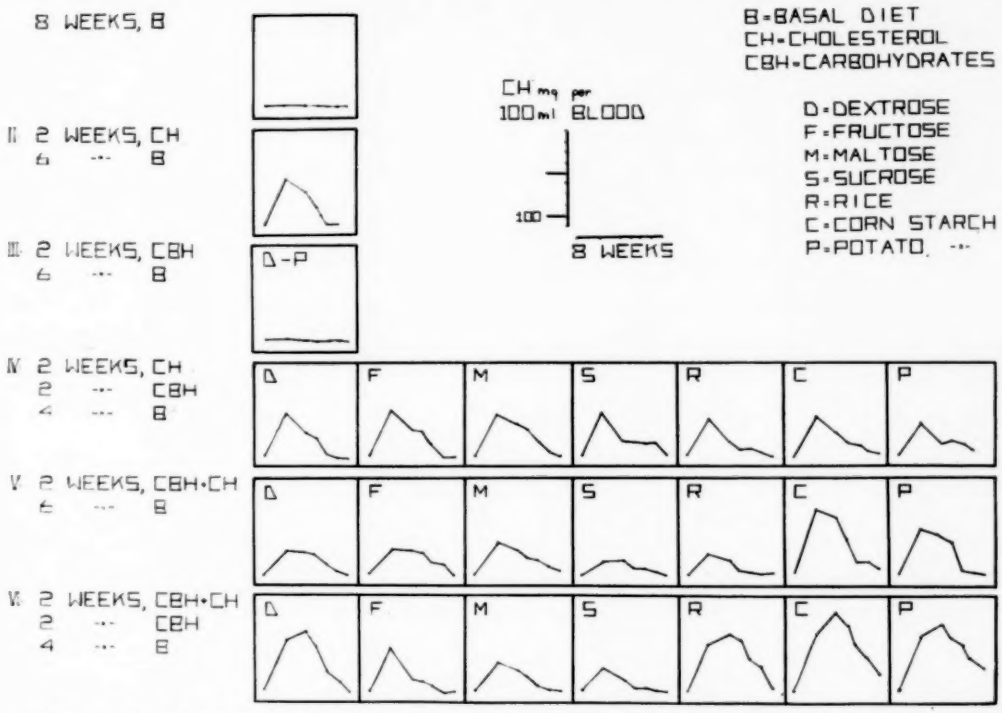

FIG. 1. Blood total cholesterol values (mg. per 100 ml.) in rabbits before and during experimental diets.

Series II. After feeding 2 Gm. of cholesterol daily for fourteen days, blood cholesterol concentration increased fivefold. Two weeks after cessation of cholesterol feeding, the blood level had decreased by 25 per cent and within two additional weeks it equaled the pre-experimental value.

Series III. In the rabbits maintained for two weeks with 7 different carbohydrate diets, the blood cholesterol level was similar to that in the control animals receiving the basal diet of chow (Series I).

Series IV. After two weeks of cholesterol feeding the blood cholesterol concentration rose to 484 mg. per 100 ml. (range, 419 mg. to 540 mg.). A downward trend started promptly after discontinuation of cholesterol feeding and, regardless of the type of carbohydrate administered, the cholesterol level had dropped by 34 per cent within the two-week period. After the next two weeks, the average level was still twice the normal—204 mg. per 100 ml. After another two weeks, at the end of the eight-week period, it was 116 mg. per 100 ml.

The slope of the curve was not the same for all 7 groups. The final level for rabbits fed corn starch was 130 mg. per 100 ml., and for rabbits fed potato starch, 131 mg. per 100 ml., although the maximal values for these two groups were lower than the peak values for 4 out of the other 5 groups in the series.

Series V. The average peak level of cholesterol for rabbits fed cholesterol and corn starch was 701 mg. per 100 ml., and for rabbits fed cholesterol and potato starch it was 513 mg. per 100 ml. For the other 5 groups, the peaks were lower than for animals fed cholesterol alone (Series II, average, 512 mg.). The values were 390 mg. for maltose, 308 mg. for dextrose, 286 mg. for rice,

243 mg. for fructose and 207 mg. for sucrose. For the whole series, the peak value was 378 mg. per 100 ml. Without the values for the two starch-fed groups, the peak was 278 mg. per 100 ml.

Two weeks after termination of these diets a few cholesterol values declined, but only moderately. Most values remained the same or increased. The average level for Series V was 362 mg. per 100 ml. (the previous one had been 378 mg.). One week later, the levels were still fairly high. At the end of the sixth week they were comparable to those in rabbits fed carbohydrates after the cholesterol diet (Series IV). At the end of the observation period, blood cholesterol levels were normal except in the rabbits previously fed maltose or corn starch (140 mg. and 165 mg. per 100 ml., respectively).

In this series, the blood cholesterol concentration in rabbits fed cholesterol-sucrose reached, after two weeks, 207 mg. per 100 ml. After another two weeks of the basal diet, it was 238 mg per 100 ml., and it became normal during the subsequent three weeks.

Series VI. Although the first two-week period of this experiment was similar to that in Series V, the response of the animals was different. It resembled the reaction of rabbits fed cholesterol alone (Series III). The blood cholesterol level for the series rose to an average of 502 mg. per 100 ml. (in Series III it was 512 mg.). Differences between the 7 groups of the series were not as pronounced as in Series V. In rabbits fed cholesterol and corn starch for two weeks, the blood cholesterol level was 645 mg. per 100 ml., and in rabbits fed potato starch it was 612 mg. per 100 ml. The combined corresponding level for the other 5 groups was 451 mg. per 100 ml. As with Series V, in rabbits fed cholesterol-sucrose, the blood cholesterol level reached only 302 mg. per 100 ml.

After the second feeding period, the blood cholesterol concentration was 511 mg. per 100 ml. (the preceding value was 502 mg.) for the whole series. This high average was caused by a sharp increase in 4 groups of the series. The blood cholesterol levels in rabbits fed first cholesterol and corn starch, and then corn starch alone, were 645 mg. and 850 mg. per 100 ml. respectively; the absolute increase was 205 mg., and the relative increase was 30 per cent. Absolute increases of 126, 118 and 102 mg., and relative ones of 20, 19 and 18 per cent, were observed in rabbits fed rice, potato starch, and dextrose, respectively. In the remaining 3 groups of the series, the decline of the blood cholesterol curve was prompt and was comparable to that in other experiments (Series III, IV).

The blood cholesterol curve for rabbits fed cholesterol-sucrose and then sucrose alone, differed markedly from those for all the other groups. The peak was 302 mg. per 100 ml. after the first two weeks of the diet, 201 mg. two weeks later, and well within normal limits three weeks thereafter.

At the end of the observation period the concentration of blood cholesterol in rabbits fed dextrose was 115 mg. per 100 ml., in spite of a rise from 568 mg. to 670 mg. during the second feeding period. The adjustment was also good for rabbits fed rice; in spite of a rise from 514 mg. to 640 mg. during the second

period, the final value was 131 mg. per 100 ml. Terminal values were normal for animals fed sucrose or maltose. Although the blood cholesterol level of rabbits fed fructose dropped rapidly after the end of the first two weeks of the diet, it was still fairly high (150 mg.) at the time of the terminal observation. After eight weeks, the blood cholesterol concentration was still 275 mg. per 100 ml. in rabbits fed corn starch, and 306 mg. per 100 ml. in rabbits fed potato starch.

DISCUSSION

The following hypotheses have been advanced to explain the different effects of various carbohydrates on the blood cholesterol level: *a*) Sugars affect the appetite, and thus food consumption and body weight. Investigations have shown that rats fed starch ate more than rats fed sucrose (12). Rabbits fed lactose ate more than those fed sucrose (13). In our experiments, rabbits fed sucrose gained least, and rabbits fed starches gained most although they consumed less food. *b*) Gastric secretion and the emptying time of the stomach are influenced by sugars. Oral or intravenous glucose can cause delay in the evacuation of the stomach, and thus delay of fat resorption in rats (14). *c*) Biliary and fecal cholic acid may vary with the type of carbohydrate diet. Sucrose and glucose decrease cholic acid in the bile and feces of rats, but corn starch does not affect this acid (15). *d*) Bile flow is influenced by sugars. Galactose and lactose, both with OH groups on C_4 and C_5, are inhibitors of bile flow in rats, whereas fructose and glucose have no such effect (16). In dogs with a biliary fistula, sucrose depresses the secretion of bile acid in the fistula (17). *e*) The proportion of bile acid to cholesterol may be modified by sugars. Retention of cholesterol during a period of sucrose diet has caused gall stone formation in hamsters (18). *f*) The absorption of cholesterol is influenced by dietary carbohydrates. In chicks, cholesterol resorption is favored by sucrose rather than glucose (3). In rabbits, lactose enhances resorption more than sucrose does (13). In rats, four different carbohydrates mixed with cholate generally induced hypercholesteremia; corn starch was the least effective, glucose and sucrose were stronger and about equal in action, and fructose was the most potent (10). *g*) Carbohydrates alter the reaction of the contents of the cecum. On feeding 40 per cent lactose to rats for only five days the pH of the cecal contents can be decreased (8); no such change in reaction occurs in rabbits (13). *h*) The intestinal microflora may be altered by dietary carbohydrates. Aureomycin seems to have a secondary effect on glucose metabolism since it enhances hypercholesteremia in chicks fed glucose and cholesterol but not in chicks fed sucrose and cholesterol (9). *i*) The change in pH due to sugars depresses the intestinal microflora which normally converts cholesterol to coprostanol. At a pH of 5.8 the cecal flora is inhibited; at the same time liver cholesterol is increased, cholesterol absorption is promoted and coprostanol formation is diminished (8). *j*) Carbohydrates contribute to the formation of triglycerides of fatty acid and other substances; some have a nitrogen-sparing effect. The faster rise of amino nitrogen after ingestion of

fructose than after ingestion of glucose points to a faster rate of metabolism of fructose (19).

It seems generally accepted that various carbohydrates do not alter the normal blood cholesterol level, and that the blood cholesterol level is influenced in different ways by various cholesterol-carbohydrate diets. Hypercholesteremic animals are affected variously by carbohydrate diets. Although most authors seem to single out sucrose as a potent hypercholesteremic agent, there is no uniformity in their reports. In our studies, sucrose retarded the development of hypercholesteremia; other sugars had little or no influence on the blood cholesterol level, and starches enhanced it. Comparison of experiments is almost impossible since different carbohydrates were fed in different quantities for different periods of time to different animal species. In addition, the total caloric intake, the amount and type of the non-carbohydrate components of diets, and many other factors varied in the studies discussed in the literature. It has been pointed out that results will vary with the length of dietary periods (11). Our experiments were of short duration. It has been demonstrated that addition of protein to the diet lessens the effect of sugars on the concentration of blood cholesterol (16), and that calcium alters cholesterol absorption and counteracts the effect of lactose (8). Moreover, the cholesterol-promoting or cholesterol-lowering effect may depend upon the purity or degree of hydration of a hexose (5).

A single factor or multiple factors may account for the different reactions to the combined cholesterol-carbohydrate diets. Many factors have been mentioned but others could be added. Consideration should be given to inhibition of an intestinal enzyme system by certain carbohydrates or by some microorganisms influenced by the diets. In our experiments, there was a fairly close correlation between the gain in body weight and the blood cholesterol response. Animals fed starches gained more weight, had heavier livers, higher and more persistent blood cholesterol levels and more aortic plaques than did rabbits fed rice or hexoses. The delay in clearing of the blood in rabbits fed carbohydrates in addition to cholesterol, or fed carbohydrates continuously after the combined carbohydrate-cholesterol dietary period, may have been largely due to competition within the liver. This organ, overloaded with lipid and cholesterol, had an additional burden caused by an exaggerated carbohydrate intake.

It is questionable which, if any, of these observations on rabbits have validity for other species, especially man. However, it is well known that more members of populations receiving high starch diets are overweight, have hypercholesteremia and have advanced atherosclerosis than members of populations whose staple diet is rice. In some areas of the world many persons, especially in low-income groups, consume large quantities of sucrose, yet their weight is lower, their blood cholesterol levels are lower, and the development of atherogenesis is slower with fewer clinical complications. Detailed scientific investigation of such populations is warranted. It seems clear that the concentration of blood cholesterol depends as much on the level of carbohydrate and protein consumption as on the level of fat and cholesterol consumption.

SUMMARY

The feeding of 7 different carbohydrate diets (dextrose, fructose, maltose, sucrose, rice, corn starch, and potato starch) to normocholesteremic rabbits had no effect on the concentration of blood cholesterol.

Carbohydrates administered to hypercholesteremic rabbits caused a fairly uniform delay in the rate at which the blood cholesterol level returned to pre-experimental values, compared with the rate in the control series.

Combined cholesterol-carbohydrate feeding had varied effects. Potato starch, and particularly corn starch, enhanced the degree of hypercholesteremia. A cholesterol-rice diet or a cholesterol-dextrose diet had an effect comparable to that of cholesterol administration. In rabbits fed cholesterol and maltose, the blood cholesterol level rose less than in the control series. A combined cholesterol-sucrose diet resulted in only a moderate elevation of the blood cholesterol level.

The reasons for the varied effects of carbohydrate diets on the concentration of blood cholesterol in rabbits are discussed. Practical applications for man are suggested.

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CONTRAINDICATIONS TO SURGERY FOR BRONCHOGENIC CARCINOMA IN THE AGED: USEFULNESS OF SCALENE LYMPH NODE BIOPSY

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When a chest roentgenogram indicates the presence of a bronchogenic carcinoma in an aged person, the thoracic surgeon is faced with two problems. First he must, whenever possible, confirm the diagnosis by microscopic examination of tissue. Secondly, he must decide whether resection of the tumor will benefit the patient. The technical feasibility of resection does not justify the operation when the tumor has spread beyond the field of this procedure, or when associated degenerative cardiopulmonary disease is sufficiently advanced to leave the patient bedfast and breathless after the operation.

Certain diagnostic techniques such as bronchoscopy, cytology of the sputum and the bronchial washings, cell block studies of thoracentesis fluid, liver biopsy, pleural biopsy and scalene lymph node biopsy have proved effective in establishing not only the tissue diagnosis, but also the status of operability. Thus an unnecessary and often dangerous thoracotomy may be avoided. We have found that cytologic examination of the sputum or pleural fluid (1) and scalene lymph node biopsy are the most rewarding techniques. Although age alone is not a contraindication to thoracotomy, there are certain absolute contraindications in the presence of suspected or proven bronchogenic carcinoma.

CONTRAINDICATIONS TO SURGERY

1. *Regional lymph node involvement*

After the intrapulmonary, hilar and mediastinal nodes, the most likely sites of involvement are the scalene lymph nodes, and less commonly the axillary nodes. The scalene nodes are located in the triangular space bound by the carotid sheath medially, the omohyoid supralaterally and the subclavian vein as the base. If metastatic carcinoma is found in these areas the patient should not be explored unless a lung abscess is present or there is repeated hemorrhage associated with the tumor; in these instances palliative resection may be considered.

2. *Disseminated pleural metastases*

This condition is usually associated with recurrent effusion and is often hemorrhagic. The diagnosis may be readily substantiated by cytologic examination of the pleural fluid or pleural biopsy (2). In these instances radioisotope therapy or radiomimetic drugs may be instituted. To detect the presence

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of cancer by means of pleural biopsy is often more difficult than anticipated (3, 4).

3. *Superior mediastinal syndrome*

Venous engorgement of the vessels of the head and neck is an absolute contraindication to thoracotomy if an histologic diagnosis has been made. Radiation therapy may be used.

4. *Metastases to distant organs*

The frequency with which liver, brain and bone are the site of metastases from primary cancer of the lung has justified liver or bone biopsy in some cases. Needle biopsy of the liver yields important information in 75 per cent of cases when metastases are present (5–7). It should be performed when hepatomegaly and an elevated serum level of alkaline phosphatase suggest liver metastases. Neurosurgical findings are the criterion for determining the presence of a cerebral metastasis—an absolute contraindication to thoracotomy.

RELATIVE CONTRAINDICATIONS

The following are relative contraindications:

1. Paralysis of contiguous nerve structures, either the phrenic or the recurrent laryngeal. This condition should be considered in the light of the associated findings, as both nerves can be resected along with the tumor.

2. Lack of cardiorespiratory reserve. No other contraindication remains more open to different interpretations. Clinical evaluation of this reserve is primarily limited to the study of ventilatory function. In the aged the deficit may be both restrictive and obstructive. If, after meticulous attention to bronchial cleansing, the maximal breathing capacity (MBC) remains 30 per cent of the predicted normal, and the first and second timed vital capacity is less than 60 per cent of the normal vital capacity, even thoracotomy may be contraindicated because of poor reserve. Nevertheless, one of us (GHL) has successfully resected a carcinoma of the right upper lobe in a 65-year-old male with an MBC of 11 per cent. Careful evaluation of exercise tolerance on the ward and measurement of maximal breathing capacity, when coordinated with fluoroscopic findings, furnish more valuable clinical criteria than do complicated techniques involving diffusion studies or selective balloon occlusion of the bronchi or segments of the pulmonary artery.

SCALENE NODE BIOPSY

Scalene node biopsy has been in use for more than ten years and its value is established (8). Table 1 shows its applicability, the percentage of positive findings, and the composite data accumulated from varied sources.

Some authors (26) believe that scalene node biopsy has little or no value in the selection or exclusion of patients for thoracotomy. Resection is carried out if the procedure is technically feasible. However, our own data at the Mason Clinic and a review of the world literature lead us to believe that this is the single

TABLE 1

Data on Scalene Node Biopsy

Authors	Pulmonary Cancer			Boeck's Sarcoidosis			Positive Findings in Extrapulmonary Cancer	Positive Findings in Miscellaneous Cases	Scalene Node Biopsies		
	No. Cases	No. positive findings	Per cent positive findings	No. Cases	No. positive findings	Per cent positive findings			No. of biopsies	No. of positive findings	Per cent positive findings
Schweppert & MacManus (9)	71	6	8.5	—	4	—	6	1	122	17	12.3
Pulwan *et al.* (10)	46	16	34.0	—		—	4	—	162	20	19.6
Cuykendall (11)	14	3	21.0	4	4	100.0	1	1	41	8	19.0
Umiker *et al.* (1)	29	7	24.0						29	7	24.0
Haagensen (12)	—	—	—	—	—	—	22	—	110	22	20.0
Connor (13)	29	9	31.0	5	4	80.0	1	3	38	17	45.5
Shefts *et al.* (14)	24	13	54.0	—	38	—	7	9	187	67	35.5
Harken *et al.* (15)	78	31	39.8	7	—	—	11	2	142	45	31.7
Carstensen *et al.* (16)	—	—	—	237	148	62.0	—	—	304	168	55.0
Skinner *et al.* (17)	53	24	45.3	5	5	100.0	11	2	100	42	42.0
Piper (18)	—	10	—	31	31	100.0	5	6	185	52	28.1
Yang (19)	—	9	—	1	1	100.0	11	4	42	25	59.5
Scott (20)	64	10	15.6	15	13	87.0	5	2	86	30	34.9
Kenney & Mota (21)	—	2	—	9	—	—	2	2	50	15	30.0
Felton & Spear (22)	22	6	27.2	1	1	100.0	3	1	35	11	31.4
Colombo & Masenti (23)	65	12	18.5	—	—	—	—	—	100	12	12.0
Josephs & Woods (24)	78	32	41.0	3	3	100.0	10	—	125	46	37.0
Bansmer, Lawrence & Hill (25)	43	21	48.8	15	14	93.3	13	2	118	50	42.3
Totals	616	211	34.2	333	266	79.4	112	35	1,916	654	33.9

most useful procedure in establishing the inoperability of a bronchogenic carcinoma. When metastatic disease is present in the scalene lymph nodes, the case is considered inoperable. A review of the records of 25 patients who had scalene lymph nodes containing metastatic bronchogenic carcinoma revealed an average life expectancy of four months (27). The percentage of "positive" scalene lymph nodes in our published series (25) was high (48 per cent), as it was in the composite series shown in Table 1 (34.2 per cent of 616 cases). Our concept that this specific involvement precludes thoracotomy is not unique and and is shared by other investigators (10, 15, 20).

To justify our enthusiasm for the procedure, it should be emphasized that the technical features of the biopsy are of great importance. We suspect that the main causes of failure to detect metastases when present are: 1) an inadequate amount of biopsy material, 2) improper selection of the site from which the specimen is obtained, and 3) lymphatic blockade by massive, proximal tumor replacement. The first of these is no doubt the greatest cause of failure.

At the Mason Clinic, a scalene node biopsy is performed at the time of bron-

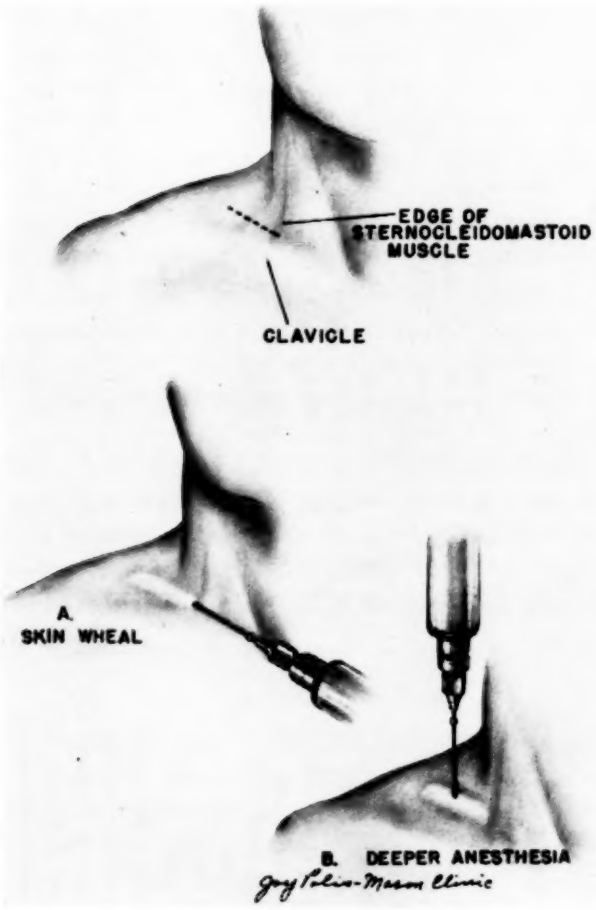

FIGURE 1

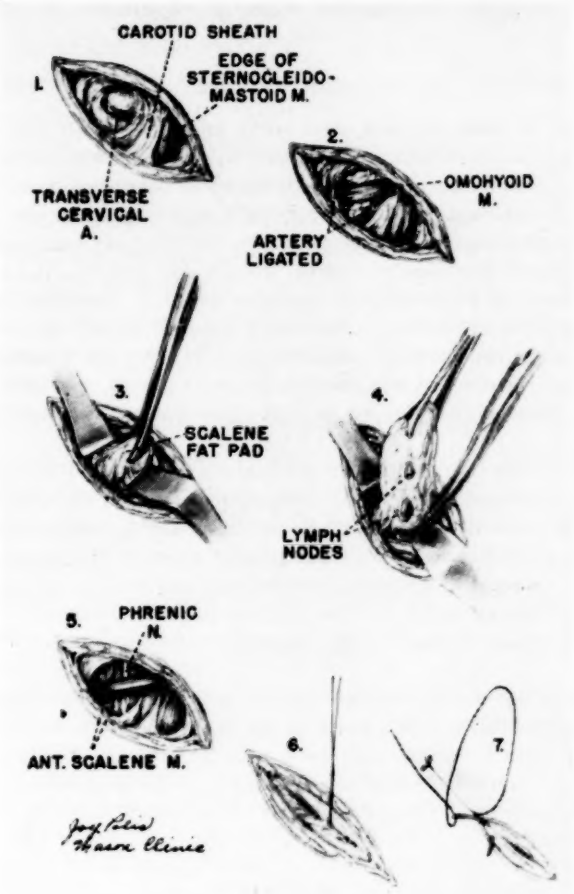

FIGURE 2

choscopy on all patients who may become candidates for thoracotomy for bronchogenic carcinoma. Both procedures are carried out under local anesthesia. On completion of the bronchoscopy, the side or sides to be explored are prepared and local anesthesia is accomplished by infiltration, as shown in Figure 1. The incision parallels the clavicle for 8–10 cm., beginning at the posterior border of the sternocleidomastoid muscle. The incision is carried through the platysma to the superficial fascia, which is divided and the underlying fat exposed. The sternocleidomastoid and omohyoid muscles are retracted. The fat pad is placed under traction and, by sharp and blunt dissection, is freed from its attachments. The transverse cervical artery is identified and either divided or retracted, to prevent troublesome bleeding. In closing the incision, the soft tissues are allowed to fall into place and the skin edges are brought together with a subcuticular suture of Nylon (Fig. 2). Complications are few; usually only serous effusion is observed. Chylous effusion and pneumothorax have been reported, however. The procedure is as safe or hazardous as the surgeon.

The following case was selected to illustrate the typical course in a patient

who had a bronchogenic carcinoma with involvement of the scalene lymph nodes:

CASE REPORT

Mr. X was found to have silicosis after forty years' work in the coal mines. He was therefore retired and his condition was followed with annual chest films. Seven years after his retirement, there was an abrupt change in the chest roentgenogram. Fluid was found on the right side, and it was thought that there might be a large tumor in the right lower lobe. Patchy infiltrates were present in the right upper lobe and left lung fields.

The patient had some shortness of breath, weight loss, polydipsia and polyuria. Laboratory studies confirmed the impression of diabetes mellitus. Bronchoscopy showed obstruction in the right main stem bronchus, but the bronchial biopsy revealed no tumor. Cytologic studies of the sputum yielded negative results, but the findings on the bronchial washings were called positive. A scalene lymph node biopsy specimen consisted of seven soft nodes. One of these nodes showed partial replacement by tumor, probably from the lung.

Course. The metastatic tissue found in the scalene node biopsy specimen was considered adequate evidence of inoperability. The patient was treated by irradiation with cobalt^{60} and antibiotics. The irradiation was well tolerated; breathing improved, appetite increased, the insulin requirement fell, and there was a greater sense of well being. Four months later, despite having been reasonably comfortable and only moderately dyspneic since discharge, severe paroxysmal coughing and a sudden increase in dyspnea developed. The patient was readmitted. The dyspnea persisted. He became unresponsive, and died several hours later.

Autopsy showed an oat-cell carcinoma arising in the right lung. There was extensive involvement of the right lung and extension along the lymphatics into the nodes on the left. The regional nodes were involved and there was massive involvement of both adrenals, but no other spread. There were silicotic nodules in both lung fields, and granulomata in the hilar nodes, suggesting active tuberculosis. Pulmonary resection would have been of little value in this patient.

COMMENT

The five-year survival rate in bronchogenic carcinoma is not encouraging. Therefore when the older patient presents himself with a lesion highly suggestive of a bronchogenic carcinoma, it is imperative that the disease be assessed with real thoroughness. In many of these cases the patient may have already accumulated so many other deficits due to aging that his life expectancy is not great. In any age group, when the tumor has escaped the confines of the lung and those immediately adjacent areas which can be resected en bloc, the disease will progress inexorably. Although a lung may still be technically resectable when distant metastases are present, it adds nothing to the patient's comfort and does not improve the survival time. Thoracotomy at best is a painful, expensive procedure attended with a fair degree of risk. The so-called "palliative resection" should be limited to patients whose course is made unduly complex by abscess formation or continuing hemorrhage. Simpler and more effective palliation can be gained from irradiation or radiomimetic therapy.

SUMMARY AND CONCLUSIONS

Unequivocal contraindications to thoracotomy for removal of a bronchogenic carcinoma are:

1. Metastatic spread to the scalene or axillary lymph nodes. Hence the importance of biopsy of these nodes.

2. Metastatic spread to the pleura. This can be confirmed by cytologic study of the pleural fluid.

3. The presence of the superior mediastinal syndrome in a patient in whom the diagnosis has been confirmed histologically.

4. Metastatic spread to distant organs. When hepatic metastases are suspected and when histologic examination of other tissues has not yielded positive findings, a needle biopsy of the liver should be attempted.

The following are relative contraindications to thoracotomy for bronchogenic carcinoma. They do not preclude operation, but generally the prognosis is poor:

1. Involvement of the phrenic and recurrent laryngeal nerves.

2. Lack of cardiorespiratory reserve. This factor is difficult to assess. Ventilatory function studies, fluoroscopic findings, and exercise tolerance studies should be carefully correlated.

The usefulness of scalene node biopsy findings as a criterion for operability in bronchogenic carcinoma is stressed. The procedure is outlined.

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BATH OILS IN THE MANAGEMENT OF DRY, PRURITIC SKIN

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Itching and annoying dryness of the skin are common complaints in patients who consult physicians for other, more specific medical reasons. In giving definitive attention to the major problem under consideration the physician may often minimize the lesser complaints, although these can be most distressing to the patient. A dermatologist's simple means for making such patients more comfortable is presented in this report.

Through the centuries various oils have been added to the bath, the objective being the deposition of an emollient film over the entire body. These oils were not widely accepted by dermatologists because of their poor dispersibility in water. Knox, Everett and Curtis (1) pioneered in the development of more therapeutically effective and cosmetically elegant bath oils. They suggested the incorporation of low-sensitizing, non-irritant, non-ionic surface-active agents into vegetable and mineral oils. This led to the commercialization of various such bath oils by pharmaceutical companies. During the past three years the author has undertaken a clinical evaluation of a combination[1] of a de-waxed oil-soluble, keratin-moisturizing fraction of lanolin, mineral oil and a non-ionic emulsifier (polyethylene-glycol laurate). Noojin (2) and Rees and Bennett (3) have recently reported that this oil is the most effective bath additive in controlling pruritus and dry skin.

In a preliminary report, Taylor (4) presented experimental evidence tending to confirm these clinical findings. The results of Taylor's experiments can be briefly summarized as follows:

1. When the proper water-dispersible bath oil is added to tub-water, the skin of the person soaking in it can adsorb as much as 50 per cent of the added oil.

2. The period of soaking in a tub-bath should be longer than ten minutes but need not exceed twenty minutes. Beyond this soaking time, little or no additional oil is adsorbed.

3. The more oil is added to bath water, the more the skin will adsorb from it. This should be kept in mind when prescribing bath oils for patients who need more lubrication than that provided by the usual dose of ½ to 1 tablespoonful per tub.

4. The proper choice of the bath oil is important. There is a great deal of difference in adsorption by the skin, depending upon the oil used. A bath oil that contains mineral oil, a special lanolin fraction and polyethylene-glycol

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[1] Alpha-Keri, manufactured by Westwood Pharmaceuticals, Buffalo, N. Y.

TABLE 1

Clinical Results with Alpha-Keri Bath Oil

Condition Treated	Patients			Results				
	Total No.	Male	Female	Good	Satisfactory	Fair	Did not like	Not tolerated
Senile pruritis	266	172	94	231	24	5	6	
Ichthyosis	14	9	5	14				
Stasis derm.	33	20	13	14	17	2		
Eczematoid derm.:								
infectious	25	19	6	3	12	10		
allergic	76	37	39	18	47	10		1
Derm. venenata	675	327	348	308	283	84		
Psoriasis	78	42	36	12	42	24		
Seborrheic derm.	40	24	16	20	12	8		
Pruritus:								
vulvar	32		32	12	20			
winter	21	17	4	8	13			
bath	8	4	4	6	2			
anal	63	47	16	40	23			
Misc. conditions	160	83	77	22	85	52		1
Totals	1491	801	690	708	580	195	6	2

laurate is adsorbed about 50 per cent more than those containing vegetable oils. The use of oatmeal-oil combinations is not recommended, since the oatmeal apparently retains the oil and the skin cannot adsorb it.

Many dermatologic conditions are aggravated by the use of soaps and other skin cleansers. The described combination bath oil affords adequate cleansing while performing its emollient function. The patients are instructed to add ½ to 1 ounce of the oil to a tub of lukewarm water and to soak in the tub for ten to twenty minutes. This provides adequate cleansing of the skin and leaves a thin film of emollient, moisture-retaining oil on the keratin. Occasionally (*e.g.*, in the treatment of psoriasis), it may be advisable to add tar to the bath in the form of 5 to 10 per cent Wright's liquor carbonis detergens.

This bath oil was first tried in 266 cases of senile pruritus (5). Good results were obtained in 86 per cent of the cases. The patients frequently complained: "I cannot tolerate a bath; soap and water irritates me and makes me itch." However, with the oil additive, all the patients were able to take these baths in comfort. About 3 per cent complained because the bath left their skin too oily; reducing the amount of oil added to the bath overcame this complaint. Our results were so satisfactory that we were encouraged to use this type of balneotherapy in other conditions. Results are presented in Table 1.

SUMMARY

A new bath oil is described. Its addition to the bath provides an emollient, antipruritic soak which is soothing to patients with dry, pruritic skin. Be

sides providing lubrication, these soaks cleanse the skin adequately, making the use of soaps and other cleansers unnecessary.

In a series of 1491 cases of various skin disorders, the results of these soothing, antipruritic cleansing baths were considered satisfactory in 86 per cent. The incidence of intolerance or sensitivity was less than 1 per cent.

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CLINICAL EXPERIENCE WITH L-GLUTAVITE IN AGED PATIENTS WITH BEHAVIOR PROBLEMS AND MEMORY DEFECTS

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With the increasing number of elderly patients who require hospitalization in nursing homes, mental institutions, and sanitariums because of the inability of the family to care for them at home, medical aids to rehabilitation are of increasing significance. New possibilities of medication have offered additional approaches to therapy. Many factors account for this increased hospital population: 1) The general lifespan is increasing. 2) Improvement in care of the hospitalized patient has greatly increased the lifespan for this particular group. 3) Year by year there is an increase in the facilities for proper nursing care. Not only do these facilities care for patients with terminal disease, but also patients with degenerative diseases, especially of the central nervous and the cardiovascular system.

This latter group presents many problems: apathy, restlessness, irritability, memory defects, confusion, emotional instability, inability to feed themselves or to care for their bowel habits, and inability to adjust to a new social environment which has been forced upon them. To meet these problems, a number of different therapeutic approaches are now available. Occupational and physical therapy are being put to greater and more varied uses. Tranquilizers and sedatives have been of some help, but often they are not well tolerated in the aged, and in many cases they intensify the very problems which they are expected to correct. Several investigators have turned to the use of drugs which act as cerebral stimulants. L-glutamic acid, in contrast to non-physiologic chemicals, is a normal link in the chain of the metabolic reactions of central nervous tissue and is known to enhance cerebral metabolism.

Previous reports (1–3) have shown that administration of L-Glutavite[1] to aged patients with behavior problems, memory defects and apathy has resulted in improvement. Other studies (4–7) with psychotic patients have indicated beneficial effects.

METHODS

Sixty-one elderly patients were studied, to determine the effects of L-Glutavite on behavior and memory defects. Patients demonstrating typical symptoms of degenerative disease of the central nervous and cardiovascular system were selected for the investigation.

Ten patients were dropped from the study—7 because of inability to make follow-up examinations, and 3 because of development of edema.

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[1] L-Glutavite powder, kindly supplied by Crookes-Barnes Laboratories, Wayne, N. J. Each teaspoonful contains: monosodium L-glutamate, 3.48 Gm.; niacin, 25.0 mg.; pyridoxine hydrochloride, 0.7 mg.; thiamine mononitrate, 0.6 mg.; riboflavin, 0.8 mg.; ferrous sulfate, 11.0 mg.; and vitamin B_{12}, 2.0 μg.

TABLE 1

Effect of L-Glutavite on Behavior and Memory of 51 Patients

Patient		Diagnosis	Condition of Patient		Result
Initials	Age & Sex		Before therapy	After therapy	
LH	84 M	Chronic brain synd.	Confused, irritable, disoriented	Less irritable; memory improved	Good
AG	79 M	Chronic brain synd.; "cord bladder"	Euphoric, forgetful; periods of marked hostility	Memory improved; more relaxed and cooperative	Excellent
AJ	71 F	Gen. arteriosclerosis	Confused, tired, depressed	Slight improvement in memory and depression	Fair
BK	69 M	Gen. arteriosclerosis; left hemiplegia	Apathetic, irritable; couldn't feed self	No improvement	Poor
RS	81 F	Gen. arteriosclerosis; bilat. cataract	Depressed, forgetful	No change in depression, but memory improved	Fair
WW	76 F	Old rheumatoid arthritis; gen. arteriosclerosis	Irritable, uncooperative	No improvement	Poor
RC	74 M	Hypertensive cardiovasc. dis; old cerebral thrombosis	Confused, disoriented, uncooperative	Improvement in cooperation; edema developed	Fair
CV	83 M	Arterioscl. heart dis.; multiple "small strokes"	Memory impaired; frequent incontinence	Marked decrease in incontinence	Good
AF	74 M	Pulmonary emphysema; cor pulm.	Apathetic, irritable	No improvement	Poor
LS	75 F	Chronic brain synd.; gen. arteriosclerosis	Marked emotional lability; would not feed self	Began to feed self; more cooperative	Good
DT	76 F	Chronic brain synd.; osteoarthritis	Forgetful, apathetic	Memory improved; more energetic	Good
DK	80 M	Chronic brain synd.; arterioscl. heart dis.	Apathetic, confused	No improvement	Poor
JB	79 F	Arterioscl. heart dis.; rt. hemiplegia	Depressed; poor memory	Slight but definite improvement	Fair
RB	82 M	Chronic brain synd.; Paget's disease	Confused, uncooperative	Marked benefit; memory, better, more alert	Excellent
DS	88 M	Gen. arteriosclerosis; bronchiectasis	Memory poor; listless and depressed	Improvement in memory; more alert	Good
FR	72 F	Hypertensive cardiovasc. dis.	Weak, apathetic, forgetful	More energy; edema developed	Fair
PC	71 F	Hypertensive cardiovasc. dis.; colostomy (ca. of colon)	Irritable, confused	More cooperative	Fair
DJ	74 F	Chronic brain synd.; multiple "small strokes"	Disoriented, listless	Less confused; more attentive	Good

TABLE 1--*Continued*

Patient		Diagnosis	Condition of Patient		Result
Initials	Age & Sex		Before therapy	After therapy	
RP	73 F	Chronic brain synd.; ca. of breast	Confused, depressed	Less depressed; memory sl. better	Fair
MB	79 M	Pseudobulbar palsy	Emotional lability	No improvement	Poor
WS	77 M	Chronic brain synd.; glaucoma	Fecal incontinence; confusion	Less confused; no incontinence	Good
AR	64 F	Hypertensive cardiovasc. dis.; emphysema	Depressed, tired, irritable	Less fatigue and irritability; sl. edema	Fair
CA	68 M	Severe osteoporosis; arterioscl. heart dis.	Belligerent, uncooperative, very forgetful	Marked improvement	Excellent
RP	71 M	Arterioscl. heart dis.; slight deafness	Very confused, disoriented; incontinence	Mod. improvement in confusion; incontinence unchanged	Fair
JS	74 F	Chronic brain synd.; rt. hemiplegia	Irritable, uncooperative, sullen	More cooperative and sociable	Good
BL	67 M	Rheumatoid arthritis; gen. arteriosclerosis	Very belligerent and confused	No change	Poor
LA	63 M	Arterioscl. heart dis.; gout	Very confused and forgetful	Slight improvement, especially less forgetful	Fair
ON	69 F	Buerger's disease; hypertensive cardiovasc. dis.	Belligerent; refused medication frequently	More cooperative except for demand for narcotics	Fair
EL	65 F	Diabetes mellitus; bilat. cataracts	Irritable, depressed	Friendly and cooperative; tested own urine first time in 10 yrs.	Good
GM	81 M	Chronic brain synd.	Could not feed self; confused	Attempted to feed self; less confused	Fair
SB	72 M	Parkinsonism	Depressed, irritable, confused	Stopped crying after 4 wks. of therapy	Good
GE	74 M	Ca. of prostate	Very confused and uncooperative	No change	Poor
IU	92 F	Gen. arteriosclerosis; hypertensive cardiovasc. dis.	Irritable incontinent, forgetful	Dramatic change; more alert and cooperative, rarely incontinent; memory improved	Excellent
LG	81 F	Osteoarthritis; gen. arteriosclerosis	Belligerent, poor memory	More cooperative; memory unchanged	Fair
EB	64 F	Chronic brain synd.; bilat. cataracts	Sl. confused; would not feed self	Attempted to feed self more often; less confused	Good
HP	71 M	Gen. arteriosclerosis; benign prostatic hypert.	Mod. confused; incontinent	More alert	Fair

TABLE 1—*Continued*

Patient		Diagnosis	Condition of Patient		Result
Initials	Age & Sex		Before therapy	After therapy	
MB	69 M	Multiple "small cardiovasc. accidents"	Cried frequently; forgetful and incontinent	No change	Poor
DC	77 F	Arterioscl. heart dis.; gen. arteriosclerosis	Confused and withdrawn	Alert, cooperative, rarely confused	Excellent
DS	68 F	Chronic brain synd.	Incontinent, confused, irritable	No change	Poor
MP	80 M	Gen. arteriosclerosis; mult. basal-cell ca. of face	Irritable, uncooperative; would not feed self	Less irritable; began to feed self	Good
EL	69 F	Recurr. diverticulitis	Very uncooperative; occasionally confused	Less confused; much more cooperative	Good
WB	68 M	Gen. arteriosclerosis	Marked confusion	Remarkably improved	Excellent
EH	73 F	Senile psychosis	Disoriented; hallucinations	No change	Poor
WK	70 M	Gen. arteriosclerosis; gout	Irritable, foregtful	More cooperative; memory improved	Good
AZ	74 M	Pseudobulbar palsy	Confused; emotional lability	No change	Poor
RG	81 M	Cor pulm.	Mental confusion; irritable	Relaxed; less confused	Good
LK	76 M	Arterioscl. heart dis.	Uncooperative, withdrawn	More sociable; took medication without difficulty	Good
KJ	80 M	Chronic brain synd.	Confused, incontinent	Alert; incontinence ceased	Excellent
GM	59 F	Hypertension; left hemiplegia	Depressed, incontinent	Less depressed; less incontinent	Fair
BB	86 F	Diabetes mellitus; arterioscl. heart dis.; bilat. cataracts	Forgetful, withdrawn	Memory improved	Fair
LB	72 M	Hypertensive cardiovasc. dis.	Apathetic; memory defective	Much more alert; memory improved	Good

Of the remaining 51 patients, 32 were hospitalized in well-staffed nursing homes where they had been for periods of from two to twenty-nine months. They were seen weekly by a physician. The other 19 were seen in office practice twice monthly. Prior to the study none of the 51 patients had shown improvement and many had become progressively worse.

L-Glutavite was given three times daily, in a dose of 1 teaspoonful (35 Gm.) dissolved in juice or administered with food. Each patient was watched until it was ascertained that the medication had been taken. The average period of L-Glutavite therapy was ten weeks, and no patient of this series took the medication for less than six weeks.

Response to treatment was recorded by physicians, families, and nurses caring for the

patients, the criteria being changes in memory, alertness, social behavior, and feeding and bowel habits.

RESULTS

The clinical results are listed in Table 1. Seven patients showed an excellent response, 17 a good response, 16 a fair response, and 11 showed no improvement. This represents a satisfactory response in 78 per cent, and failure in 22 per cent.

Improvement was manifested primarily by better memory and cooperation. Although the results were necessarily based on subjective factors, the response was sufficiently clear to warrant the foregoing classification.

The treatment caused no untoward effects except development of edema in 6 severely decompensated cardiac patients. However, in only 3 of the 6 was the edema severe enough to necessitate discontinuance of the medication.

DISCUSSION

The administration of L-Glutavite resulted in improvement of the behavior and memory of aged patients with degenerative central nervous system and cardiovascular disease. The benefit seemed to be correlated with the duration of therapy and reached a peak in most patients after eight weeks. The medication was well accepted and no patient refused to take it—an important factor in this age group.

The edema which developed in 6 decompensated cardiac patients was apparently the result of increased sodium intake. In only 3 of the cases was it necessary to discontinue L-Glutavite. There was no opportunity to determine whether modern diuretics that promote sodium excretion preferentially would correct the edematous condition.

The favorable results obtained in this series and corroborated by other investigators make it tempting to assess the value of L-Glutavite from a pharmacologic point of view. This, however, is difficult and not the purpose of this report. Two components of the drug, monosodium L-glutamate and B-complex vitamins, each have a specific, and perhaps also a nonspecific action. In contrast to other amino acids, glutamic acid plays an important role in several metabolic reactions in the brain. It is oxidized to ketoglutaric acid, an essential member of the Krebs cycle; it is decarboxylated to gamma-aminobutyric acid, a reaction specific for central nervous tissue; and also it participates in transamination reactions.

Himwich and associates (1, 8) reviewed the usage and effects of monosodium L-glutamate as a physiologic stimulant of brain metabolism and noted that glutamic acid is best absorbed as the monosodium salt.

Barrabee and co-workers (9) showed the superiority of L-Glutavite to a combination of nicotinic acid and pentylenetetrazol. We have confirmed their observations. Thirty-four patients had received and not responded to such a combination. When L-Glutavite therapy was instituted, 28 (82 per cent) showed significant improvement. Likewise, 4 patients who had been taking amphetamine derivatives without benefit showed definite improvement from L-Glutavite therapy.

SUMMARY

Fifty-one elderly patients with central nervous or cardiovascular disease were treated for a minimal period of six weeks with a powder containing monosodium L-glutamate, B-complex vitamins and ferrous sulfate (L-Glutavite). In 78 per cent there was satisfactory improvement in behavior or memory defects.

Double-blind placebo studies would have been desirable, but it was not possible in this instance because of inability to prepare a placebo that had the sodium-glutamate taste of L-Glutavite.

The medication was well accepted. There were no adverse effects other than the edema which occurred in 6 cardiac patients. In only 3 of the 6 patients was the edema severe enough to warrant cessation of therapy.

L-Glutavite proved to be superior to amphetamine derivatives in 4 patients, and superior to a combination of nicotinic acid and pentylenetetrazol in 82 per cent of patients so treated prior to L-Glutavite therapy.

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MEPROBAMATE-PROMAZINE THERAPY FOR AGED PSYCHIATRIC PATIENTS WITH CHRONIC BRAIN SYNDROME ASSOCIATED WITH ARTERIOSCLEROSIS

A Preliminary Report

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It is unfortunate that in a society which is dedicated to the prolongation of life, so little has been done to provide for the future socio-economic status of the aged. Fortunately, society has become more cognizant of this problem during recent years because of the tremendous increase in the number of persons who have attained an age of 65 or more years, and because of the increase in the number of elderly patients who are now being institutionalized.

Until recently, chronic brain syndrome associated with cerebral arteriosclerosis with psychotic reaction and behavioral reaction was considered hopeless from the standpoint of treatment, and little attention was given to these elderly patients.

It is now known that improvement in the mental condition of these patients can be attained through improvement in their physical condition and by psychotherapy (1–3). Rothschild (4) demonstrated that there was no relationship between the degree of arteriosclerotic change and the mental condition; indeed, in some of the more severely disturbed patients, there were fewer changes than in some who were mentally alert up to the time of death.

The onset of psychosis is frequently associated with stress, sociologic or psychologic, and by the aggravation of personality characteristics. It is not possible to change hereditary or constitutional factors; however personal and social factors are subject to modification, and therein lies the basis for treatment.

When these patients continue to fail in their adjustment, physical disorders, behavioral disturbances, and emotional overactions evolve due to frustration and personal suffering.

When these disturbances are mild, the patient may respond to a good doctor-patient relationship; however most of these people are institutionalized after their behavior can no longer be controlled at home or is unacceptable to society. Usually, they are negativistic, hallucinatory, delusional, disorientated, agitated, and antagonistic. Since they are not verbally able to benefit from psychotherapy, and are unable to discuss their problems, the first step in their treatment must be the reduction of agitation and hyperexcitability before any adequate program of rehabilitation can be instituted.

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PHARMACOLOGIC AGENTS IN PSYCHOTIC AND BEHAVIORAL REACTIONS

Heretofore, barbiturates and other sedatives were used extensively. Although the patient was calmed by the sedative, he became even more confused and was not amenable to psychotherapy.

The introduction of ataractic agents provided a new and much more effective form of treatment. Tranquilizers are now being used more extensively since it has been proved that they have a pronounced beneficial effect on behavior by controlling disorderly conduct, anxiety reactions, hallucinations, agitation and delusions. In exerting a sedative action they do not cause too much interference with the mental processes (5); however they do not have any effect on mental deterioration and any improvement must result from the removal of the emotional factors which originally caused the psychosis.

MEPROBAMATE AND PROMAZINE HYDROCHLORIDE

The efficacy of meprobamate and promazine used separately in the treatment of psychiatric disorders has been well established by numerous investigators (6–13). Settel (14), however, was the first to use a combination of these agents, in predetermined amounts, in the treatment of senile patients. As each agent affects different pathways (promazine acts on the hypothalamic region and meprobamate acts on the thalamic region of the brain) and as emotional disturbances apparently may involve multiple neural pathways, Settel decided to evaluate the effectiveness of capsules containing a fixed dose of the combined agents in the management of 58 institutionalized agitated patients who were senile. Settel found that there was an improvement in the clinical response of 94.8 per cent of the patients so treated. There appeared to be a synergistic action between the two agents when they were administered in combination, as the amount of promazine required was considerably less in combination than when used alone.

Since the completion of Settel's study, combined meprobamate-promazine therapy has been used in the treatment of various psychiatric disorders by a number of different investigators (15–17), all of whom agree that therapy with the combined agents adequately controls the agitated patient and makes him amenable to psychotherapy and rehabilitation procedures.

Because of the results obtained by these investigators, and because of the poor results obtained with other individual ataractic agents and sedatives, a preliminary study was carried out to determine the efficacy of the combined medication in the treatment of geriatric patients who had chronic brain syndrome associated with cerebral arteriosclerosis with psychotic and behavioral reactions.

PATIENTS AND PROCEDURE

Twenty-six male geriatric patients ranging in age from 65 to 85 years were selected for this study. Seventeen had been hospitalized for periods ranging from four months to ten years; 9 were on convalescent leave and were seen on an outpatient basis. All 26 were classi-

fied as having chronic brain syndrome associated with cerebral arteriosclerosis, with psychotic and behavioral reaction.

Physical condition. The 26 patients were in fairly good general physical condition and all were ambulatory. None had signs or symptoms of acute or chronic organic disease except generalized arteriosclerosis (including cerebral arteriosclerosis) in moderate to far advanced stages. Nineteen patients had hypertension; however individual blood pressure readings did not exceed 190/110 mm. Hg.

Emotional disturbances. All 26 patients manifested marked anxiety, agitation, restlessness, tension, apprehension and occasional unpredictable behavior, and most of them also had insomnia. Twenty of the 26 were in extremely poor contact with reality, and 16 experienced occasional hallucinations, both visual and auditory. There was extremely poor communication with these patients, and all of them were uncooperative.

Previous medication. Eight patients had received chlorpromazine, 11 had received reserpine, and the remaining 7 had received sedatives. All previous medication was discontinued for at least ten days before meprobamate-promazine therapy was instituted.

Schedule for physical examinations and laboratory studies. Each patient underwent a complete physical examination before institution of therapy, and a physical examination once each week after therapy began. Laboratory tests, including complete blood counts, urinalysis, and blood urea nitrogen and bilirubin levels, were performed before the start of therapy and every ten days thereafter.

Meprobamate-promazine therapy. Treatment with a meprobamate-promazine combination[1] was started in the first week of January 1960, and has been continued to date. The combined medication was administered in capsule form. Each capsule contained 200 mg. of meprobamate and 25 mg. of promazine hydrochloride. The initial dosage of the medication was limited to 3 capsules daily. The dosage was gradually increased according to the condition and requirements of the patient, and his response to the medication. The amount of medication prescribed daily did not exceed 6 capsules. When the desired response was obtained, the amount of medication administered was gradually decreased to the original dosage level. No other medication, *i.e.*, tranquilizers or sedatives, was administered in conjunction with the meprobamate-promazine combination.

RESULTS

In the three months to date (January–March 1960) of this continuing study, 21 of the 26 patients (81 per cent) have shown marked improvement. The remaining 5 patients (19 per cent) have shown some improvement in that they have become more calm, more quiet, and more cooperative.

For 11 of the 26 patients, it was necessary to increase the dosage of medication to 2 capsules three times daily. The dosage was continued at this level for two weeks until a satisfactory response was obtained (improvement in behavior and in attitudes), and then decreased gradually to 1 capsule three times daily. A good response was noted on the third day of treatment.

Fourteen of the 16 patients who were hallucinating in both the auditory and visual spheres showed no signs of hallucinations after the sixth day of treatment.

In 20 of the 26 patients, signs of anxiety and agitated behavior disappeared. In the remaining 6 patients, there were occasional signs of mild restlessness, but all were fairly cooperative.

Most of the patients slept for longer periods of time and their appetites improved. Only a slight increase in weight, from 5 to 8 pounds, was noted during treatment.

[1] Prozine,® supplied for this study through the courtesy of Wyeth Laboratories, Philadelphia, Pa.

Results of the laboratory tests performed every tenth day were within normal limits. The blood pressure was decreased in all patients (systolic, from 10 to 15 mm. Hg). In none were there any severe side-effects. Drowsiness occurred at the beginning of treatment; however this sign disappeared as therapy was continued. In 2 patients there were several episodes of fainting; at the time of the spells, the blood pressure fell to approximately 80/50 (previously 110/80). These patients were receiving 6 capsules daily and when the amount of medication was decreased the fainting spells no longer occurred.

At the present time, 21 patients are receiving 3 capsules daily and 5 patients are receiving 5 capsules daily (3 capsules during the day and 2 at bedtime).

CONTROL STUDIES

A placebo control study was established with 24 patients in the same diagnostic and age categories. These 24 patients were given placebo capsules for a period of five weeks. Only the pharmacist knew which patients received the drug capsule and which patients received the placebo capsule. The behavior of the patients was evaluated in the wards by nurses with the help of a specially designed form for recording each patient's response. These records were carefully checked by me for any change in signs or symptoms. At the end of five weeks. not even slight improvement was noted in the patients receiving placebos.

COMMENT

The results obtained in this study are in accord with those obtained by other investigators with the use of meprobamate and promazine in the treatment of psychotic patients (14–17). In the treatment of patients who have chronic brain syndrome associated with arteriosclerosis with psychosis and behavioral problems, the combined medication elicited an excellent response with a minimal amount of medication and without the side-effects so frequently seen when larger doses of other individual tranquilizers or sedatives were prescribed.

In the treatment of diseases of this type, it must be remembered that ataractic agents alone or in conjunction with psychotherapy are not a cure for the underlying aging processes, and the most that can be expected is the rehabilitation of these patients so that they can again assume their proper place in society. The use of the combined medication facilitated their control and management and made them more amenable to psychotherapy and to rehabilitation programs which, in turn, helped them to adjust to their altered status in society.

Some patients who have adjusted sufficiently to be discharged continue to make adjustments at home; however others find the transition from the institutional environment to the home too difficult, and require supportive therapy in the form of maintenance doses of the medication and periodic return to the institution for additional psychotherapy.

The combined form of meprobamate and promazine is a welcome adjunct to the psychotherapeutic treatment of these patients when through its use we can, as so effectively stated by Wolff (18) ". . . not only add years to life but life to years."

CONCLUSIONS

Striking improvement in the mental condition of 21 (81 per cent) of 26 patients who had chronic brain syndrome associated with cerebral arteriosclerosis with psychosis and behavioral problems was obtained with the use of combined meprobamate-promazine therapy. The remaining 5 patients showed some improvement, in that they became more quiet, calm and cooperative.

The amount of the combined meprobamate-promazine medication required to produce improvement did not give rise to the severe side-effects frequently noted with the use of individual tranquilizers and sedatives.

The combined medication facilitated the control and management of these patients, made them more amenable to psychotherapeutic and rehabilitation programs, and was an excellent adjunct to psychotherapy.

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NUTRITIONAL SUPPLEMENTATION FOR ELDERLY PATIENTS IN A STATE MENTAL HOSPITAL: EFFECT ON APPETITE AND WEIGHT GAIN

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A well balanced diet is as important in old age as in childhood or young adulthood, and the problems involved in providing such a diet for aged patients have received considerable attention. Many factors, including social, economic, physical and emotional, influence the nutritional state of the elderly patient. If left to himself, the average person in the geriatric age group tends to select a diet too high in carbohydrate and too low in quantity and quality of protein (1). Vitamins and minerals are also neglected. The protein requirements of the elderly are not known precisely, but some authorities believe they are higher than those proposed for the average healthy adult by the National Research Council. Recommendations have ranged as high as 1.2–2.0 Gm. of protein per Kg. of body weight per day in contrast to 1.0 Gm. per Kg. per day for the average healthy adult (2, 3).

Nutritional maintenance of the elderly is particularly difficult in an institutional setting when accompanied by serious mental illness (4). In such a situation, attractively prepared meals served under adequate supervision will result in less wastage of food and better morale for the patient, as well as maintenance and improvement of nutrition (5–7). This is particularly true when ward personnel demonstrate obvious interest in the patients and their dietary needs.

However, most institutions find the necessity of providing low-cost meals involving a minimum of supervisory personnel to be in direct conflict with these goals. Such factors, as well as the degree of psychiatric disability, all contribute to an inadequate intake of nutrients, especially protein and vitamins. These nutritive deficits beget further disability in the form of additional mental changes, increased weakness, anorexia and weight loss. A vicious cycle is initiated.

In an attempt to overcome these problems in our elderly psychotic patients, we wished to find an easily administered, inexpensive, palatable and well-tolerated nutritional supplement, high in protein and calories and containing adequate vitamins and minerals—and to evaluate its effectiveness in preventing weight loss and consequent debility.

In addition, it was felt desirable to determine the effect of this supplemental nourishment on appetite and food intake at regular mealtimes because, in order to justify its use, it was necessary to prove that it was a true supplement to the diet, and not merely a replacement for other portions of the daily menu.

METHODS

Patients for this study were selected from one ward of psychotic females at a state mental hospital. The treatment and control groups consisted of 23 and 22 patients, respectively.

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The treatment group included patients who were the most serious feeding problems in the unit with respect to ability to feed themselves, weight loss, and refusal of food as shown by the waste on their plates after meals. Thus, the two groups did not represent feeding problems of equivalent severity. It was thought that the study would be more critical if the poorest eaters were in the treatment group, since these are the patients who can be least ably handled by ordinary feeding methods. No attempt was made to select subjects on the basis of organic diseases such as arteriosclerosis or diabetes mellitus. None of the patients demonstrated symptoms of gastro-intestinal disease during the study. In the treatment group the ages ranged from 57 to 89 years (average 72.5), and in the control group from 60 to 87 years (average 73.1).

All patients ate in a community dining room and were required to feed themselves, if possible. Mealtimes were 7:00 a.m., 11:30 a.m. and 5:00 p.m., and all patients received the same fare. Average daily food offerings contained 2674 calories and 87 Gm. of protein. The average caloric intake was divided as follows: breakfast, 768 calories; lunch, 988 calories; dinner, 918 calories.

The duration of the study was eight weeks. Patients were weighed initially, and at the end of the fourth and eighth weeks.

As a further check on food consumption and eating habits, and to ascertain whether the supplement was *adding* nutrition or only replacing ordinary foods, plate wastage was measured by a designated member of the food service team over three-day periods, initially, and at two, four and eight weeks (8).

The dietary supplement provided for the patients of the treatment group consisted of a high-protein liquid nourishment: a) in the mid-afternoon, early enough not to impair appetite for the evening meal, and b) before retiring. The supplement was administered during medication rounds by the ward staff. Care was taken to see that the control group received as much attention centered on eating activities as did the treatment group. The two glasses of supplementary nourishment, furnished in either chocolate or vanilla flavor, contained a total of 2 ounces of Meritene,[1] 2 ounces of nonfat dry milk, and 16 fluid ounces of water. This provided 380 calories, 36 Gm. of protein and over 50 per cent of the National Research Council's recommended optimal daily allowances of essential vitamins and minerals for the average adult.

RESULTS

The weights for the treatment group initially and during the course of the study are listed in Table 1. These patients tolerated the supplementary nourishment very well. Although they were the most difficult feeding problems in the ward, they liked and readily accepted this supplement throughout the eight-week period. The one exception, a severely regressed schizophrenic who had been hospitalized for a long time, refused the supplement intermittently. Among the treatment group, one patient who failed to gain weight subsequently was found to have a malignant gastro-intestinal neoplasm which was undetected at the time of this study.

The comparable data for the control group are listed in Table 2. These pa-

[1] Meritene, supplied by The Dietene Company, Minneapolis, Minnesota. Each 8-ounce glassful contains: protein, 18 Gm.; iron, 4.46 mg.; vitamin C, 25.7 mg., vitamin A, 2380 I.U.; vitamin B_1, .77 mg.; vitamin B_2, 1.64 mg.; niacin (equiv.), 10.06 mg.; vitamin D, 161 I.U.; pyridoxine B_6, 200 μg.; vitamin B_{12}, 1 μg.; folic acid, 2.7 μg.; pantothenic acid, 1.7 mg.; calcium, 0.57 Gm.; sodium, .25 Gm.; potassium, .72 Gm.; magnesium, 51 mg.; phosphorus, .46 Gm.; copper, .05 mg.; iodine, .03 mg.; fat, 0.3 Gm.; carbohydrate, 29.1 Gm.; and calories, 191 (270 calories if mixed with whole milk).

TABLE 1

Treatment Group

Case No.	Diagnosis	Weight (Pounds)			Total Weight Gain or Loss
		Initial	4 Weeks	8 Weeks	
1	Cerebral AS* with psychotic reaction	67	81	78	+11
2	Cerebral AS with psychotic reaction	95	97	97	+2
3	CBS†, psychotic reaction	82	85	86½	+4½
4	CBS	86	90	89½	+3½
5	Schizophrenic reaction, paranoid type	90	93	92½	+2½
6	CBS	96	101	100	+4
7	Schizophrenic reaction, simple type	97	95	96	−1
8	CBS	69	73	73½	+4½
9	Schizophrenic reaction, simple type	79	82	84	+5
10	CBS	95	99	101	+6
11	Cerebral AS with psychotic reaction	72	76	79	+7
12	Cerebral AS with psychotic reaction	85	90	94	+9
13	Cerebral AS with psychotic reaction	85	93	95	+10
14	Cerebral AS with psychotic reaction	116	119	121	+5
15	CBS	117	117	120½	+3½
16	Chronic undifferentiated schizophrenic reaction	93	100	100	+7
17	Involutional psychotic reaction, paranoid type	71	70	73	+2
18	Involutional psychotic reaction, melancholia type	102	103	104	+2
19	Cerebral AS with psychotic reaction	94	96	94	0
20	Cerebral AS with psychotic reaction	76	75	74	−1
21	Cerebral AS with psychotic reaction	102	108	109	+7
22	Cerebral AS with psychotic reaction	96	97	99½	+3½
23	Cerebral AS with psychotic reaction	102	106	110	+8

* Arteriosclerosis.

† Chronic brain syndrome.

tients responded favorably to the increased attention and concern about their weight and eating habits.

The average percentage weight gain, plotted in Figure 1, shows the substantial increase in weight in those patients who received the additional nourishment as compared to the moderate increase in weight in subjects of the control group. The difference in the rates of gain between the two groups was most pronounced during the first four weeks of the study, but was clearly apparent throughout the entire test period. At the conclusion of the study, the average percentage weight gain for the treatment group was 2.8 times that for the control group.

Measurements of the food remaining uneaten on the plates during the three-day test periods are shown in Figure 2. By subtracting the amount of waste from the amount of food offered, it was possible to calculate the average daily caloric intakes of the two groups of subjects (Fig. 3). In the graph, the 380

TABLE 2

Control Group

Case No.	Diagnosis	Weight (Pounds)			Total Weight Gain or Loss
		Initial	4 Weeks	8 Weeks	
1	Schizophrenic reaction, chronic undifferentiated type	97	98	98½	+1½
2	Schizophrenic reaction, simple type	129	138	137	+8
3	CBS* with psychotic reaction	112	113	109	−3
4	Cerebral AS† with psychotic reaction	123	125	125	+2
5	Cerebral AS with psychotic reaction	127	129	130	+3
6	Cerebral AS with psychotic reaction	124	123	121	+3
7	Cerebral AS with psychotic reaction	115	112	116	+1
8	Cerebral AS with psychotic reaction	126	126	128	+2
9	Cerebral AS with psychotic reaction	100	102	103	+3
10	Cerebral AS with psychotic reaction	88	92	96	+8
11	Schizophrenic reaction, chronic undifferentiated type	98	101	102	+4
12	Cerebral AS with psychotic reaction	102	102	105	+3
13	Involutional psychotic reaction, simple type	93	96	95	+2
14	Acute brain syndrome and disease of unknown or uncertain cause	96	100	105	+9
15	Cerebral AS with psychotic reaction	127	131	130	+3
16	Cerebral AS with psychotic reaction	96	99	98	+2
17	Cerebral AS with psychotic reaction	108	107	111	+3
18	Schizophrenic reaction, chronic undifferentiated type	108	109	106	−2
19	Cerebral AS with psychotic reaction	118	120	113	−5
20	Involutional psychotic reaction, mixed type	111	112	114	+3
21	CBS associated with disturbance of metabolism, growth or nutrition with psychotic reaction	119	119	117	−2
22	CBS with psychotic reaction	144	141	145	+1

* Chronic brain syndrome.

† Arteriosclerosis.

calories provided by the supplement is superimposed to show this contribution to the nourishment of the treated patients.

CASE ABSTRACTS

The following are representative case histories:

Case 1. This 89-year-old female had cerebral arteriosclerosis, chronic brain syndrome, arteriosclerotic vascular disease and marked dorsal kyphosis. She had recently undergone a major operation for intestinal obstruction. Two weeks after admission to the ward, she was placed in the treatment group. Her body made maximal use of the protein, vitamins and calories she had evidently been denying herself prior to admission to this hospital. Her total weight gain was 11 pounds.

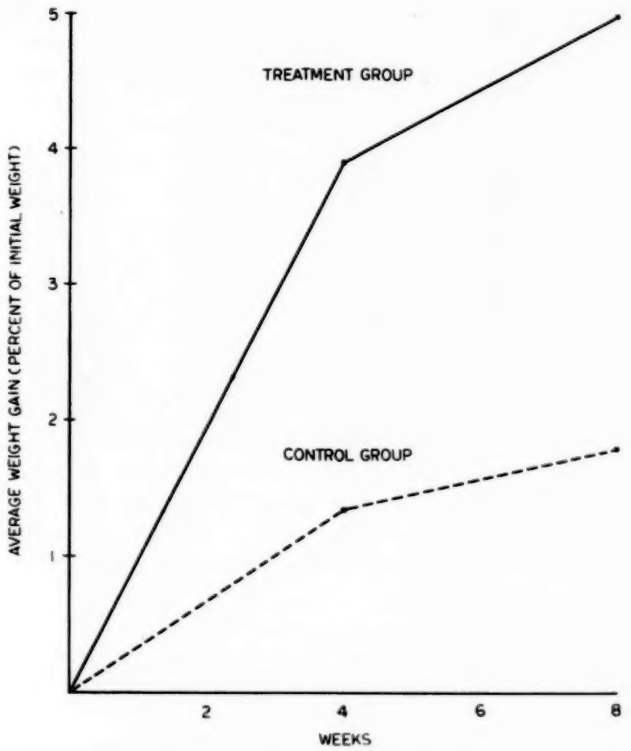

FIG. 1. Average percentage increases in weight for the treatment and control groups.

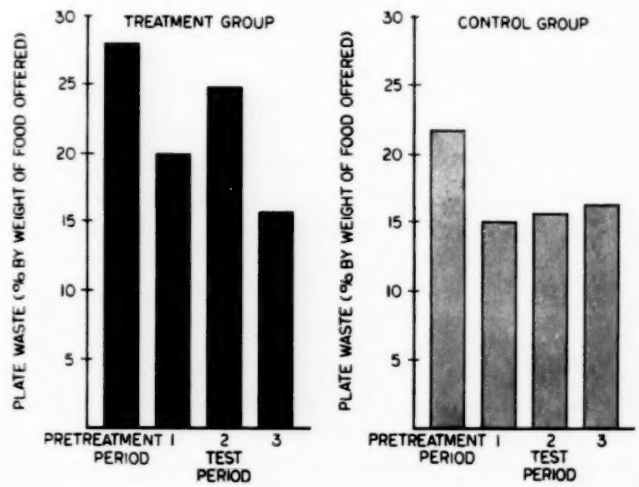

FIG. 2. Food waste for treatment and control groups during four three-day measurement periods.

Case 6. A 76-year-old female with cerebral arteriosclerosis and chronic brain syndrome was admitted to the hospital in May 1958 weighing 155 pounds. Her decline in weight after that time was steady and accompanied by increasing weakness, although her physical activity was maintained at a fairly good level. Her hospital course included "strokelets" at various intervals. Her weight gain in the study was 4 pounds.

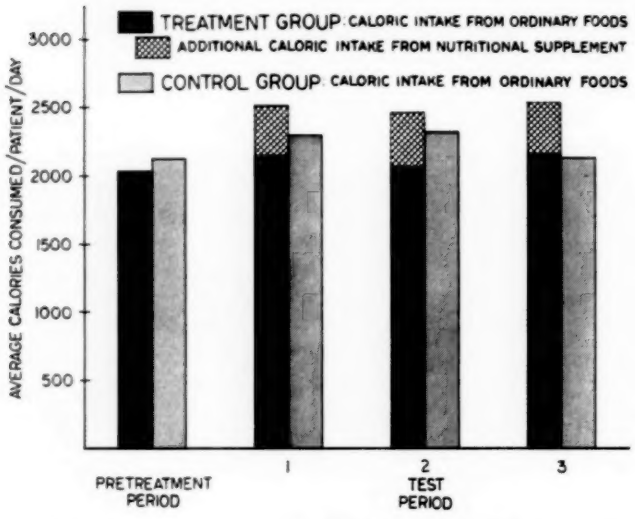

FIG. 3. Average net calories consumed per patient per day in treatment and control groups, calculated as calories offered minus calories lost in plate waste.

Case 21. A 77-year-old female with cerebral arteriosclerosis and chronic brain syndrome was admitted in February 1959, having proved unmanageable and suicidal in nursing homes. Her weight on admission was 120 pounds. It had dropped slowly to 100 pounds by the time supplemental therapy was started. In addition to a weight gain of 8 pounds some reduction in sedation requirements was noted during the study.

DISCUSSION

This study illustrates three important points in regard to nutritional maintenance in institutions:

1) A weight gain may be expected when dietary supplementation is used.
2) Dietary supplementation, when properly spaced between meals, does not reduce or interfere with the mealtime caloric intake.
3) Emphasis on food intake and concern for the patient's eating habits are also important factors in the maintenance of nutrition in an institutional setting.

Weight gains occurred in both the treatment and control groups during the study periods. The fact that the control subjects gained an average of 2 pounds over the eight-week period demonstrates the improvement produced by increased emphasis on eating and increased attention given to the patients in the study. In the treatment group, although there were more serious feeding problems, the average gain in weight was 4½ pounds over the study period. This weight gain illustrates the advantage of dietary supplementation over and above the increased emphasis placed on food.

The plate waste studies (Fig. 2) showed that the patients left 15 to 25 per cent of the offered food on their plates. The fact that the treatment group represented the more severe feeding problems initially was confirmed by the greater amount of plate waste for that group before the start of the study. This greater waste was found during every measurement period but the last. The important point

is that the increased calories and food volume represented by the dietary supplement did not change appreciably the plate waste for the treatment group. The advantage of such supplementation would be obviated if caloric consumption during regular mealtimes decreased in direct proportion to the amount of supplement used. However, this did not occur in our study. The extra nourishment offered did, in fact, *supplement* the usual caloric intake of the patients, as shown graphically in Figure 3. The mealtime caloric intakes of the two groups varied minimally, and the 380 additional calories supplied by the supplement raised the average daily caloric intake of the treatment group well above that of the control group in every measurement period. Thus, there is a documented basis for the difference in weight gains, as previously discussed.

In addition, benefits other than strictly nutritional were observed in the treatment group. The glass of warm supplementary nourishment at bedtime seemed to have some sedative effects; the need for sedative medications was lessened and there were fewer nocturnal disturbances on the ward.

CONCLUSIONS

Maintenance of nutrition in the aged institutionalized patient is the product of a number of factors including attitudes of the supervisory personnel, attractiveness of the food, and the severity of the patient's psychiatric and physical disability.

In this study, a nutritional supplement composed of Meritene (protein, carbohydrate, fat, vitamins and minerals) plus nonfat dry milk and water, produced a substantial weight gain over an eight-week period in a group of 23 elderly psychotic females. The percentage weight gain in this group was almost three times that in a similar group of 22 controls. In addition, measurements of plate wastage revealed that the nutritional additive did indeed supplement and did not decrease the ordinary food intake at mealtime.

An economical, well tolerated, easily administered dietary supplement may be at least a partial answer to the nutritional problems of elderly institutionalized patients.

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REFLECTIONS OF A RETIREE IN HIS EIGHTIES

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The days and years of retirement can be the most useful and enjoyable of all years, the consummation and flowering of the active, challenging years. Also, they can be the most disturbing, disconcerting, useless and unsatisfactory of all. Which they shall be is largely under the individual's control. The decision is a personal one. The good life after 70, which people desire and hope to enjoy, must be paid for beforehand; the unsatisfactory, frustrating *existence* can and will be paid for after retirement. The first requires a conscious choice; the other can come merely by *not* choosing.

Somewhere around age 40 to 60, definite thinking about retirement ought to begin. Instead of *no* plans for the retired years, or only last-minute makeshift plans hurriedly thrown together, the man of wisdom develops thoughtful, matured plans. Separation from the job need not come as a shock; it can arrive as a natural process in the ongoing life of the individual. Emphasis may be shifted gradually from the regular, fulltime job to the less exacting, more irregular activities. The person who has enjoyed his regular work naturally wants to continue certain phases of it into retirement. Other interests will have suggested themselves during the active, planning years, especially for the 60–70 year age period. Both new and old activities can now be followed leisurely with full enjoyment. It is clear that wise planning is the responsibility of the person directly concerned, and that it pays generous rewards during the later, less exacting years.

WHY RETIREMENT!

Possibly the word "retirement" ought to be discarded. It carries the wrong meaning. If the person cannot get rid of the *word* immediately, he can flee from its connotation as from a pestilence. Webster says retirement means "withdrawing into seclusion or retreat; withdrawal from circulation." That idea, fixed in the thinking of workers, brings terrible tragedy to older persons after separation from the life work. We smile approvingly when someone says that after his job ends he plans to take a chair and sit on his porch for a year; after that he may begin to rock a little. Human nature is such that it will rebel violently at such a procedure. Idleness soon brings tragedy. "The idle are a peculiar kind of dead that cannot be buried," runs an Oriental proverb. According to Dr. William Raab, University of Vermont College of Medicine, "Medical studies show that prolonged physical inactivity causes an outpouring of adrenalinlike hormones which produce degenerative changes in heart muscle and chambers." Mind, body and spirit must be active in order to live. Continued existence with

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a minimum of motion is possible for a while; to live, to be really alive, our whole being requires activity. To live and have the highest personal enjoyment with genuine inner satisfaction, we not only have to be active, we must be able to see results of our activities in the lives of children and adults around us. Passive, inactive retirement has only one advantage—the person who withdraws into idleness is apt to shorten his own life and thus soon end his misery. Older persons need desperately to discard that word "retirement" and begin thinking of a joyous shifting of emphasis to fuller, more creative living. Pre-retirement planning will of necessity give consideration to several important areas of life, some of which are mentioned briefly here.

INTELLECTUAL INTERESTS

There is every reason for continuing the pursuit of knowledge and understanding throughout the retired years. In fact the pursuit can and *must* be continued. Thorndike, the well known Columbia University psychologist, convinced his students that adults, even older adults, *can* learn. He said, "Mature men and women can learn almost anything they want to. Adults are plastic and teachable in every mental function." During the decade prior to age 70, wise planning for a continuation of the development and use of mental functions and the avoidance of ruts, grooves and hardening of plastic abilities, can guarantee mental flexibility into the seventies, eighties or even nineties. For example, Shirley W. Smith, longtime Business Manager and Vice-President of the University of Michigan, during his retirement wrote two notable biographies: one of President James Burrell Angell, 1870–1910, and the other of Harry Burns Hutchins, also President of the University of Michigan. Mr. Smith was mentally active far into his eighties, and both happy and cheerful to the end. Older adults must, at all costs, avoid slipping into a condition of static mentality during their years of retirement. For persons who have been engaged in intellectual activities, a continuation of such pursuits naturally puts verve, vivacity and added pleasures into the retired years. Longfellow wrote:

"For age is opportunity no less
Than youth itself, though in another dress,
And as the evening twilight fades away
The sky is filled with stars invisible by day."

PHYSICAL FITNESS

One of man's first duties to himself and to society is that of being a healthy animal. Yet only an infinitesimally small percentage of people are vitally interested in obtaining and maintaining their health at a high level. They are interested in being up and about the daily tasks, but only a few persons think seriously about those things which provide physical fitness for the running of life's race joyously and efficiently for as long as possible. Men, and women also, seem almost to cherish a few aches and pains for conversation starters, even when they surely know that these put limitations on their daily performance. The human animal is so plastic and pliable, and so completely mouldable by

thoughtfully exercised will power, that in most instances it is possible to have the kind and quality of health which we desire. Three score years ago Dr. William James of Harvard University said, "The greatest discovery of my generation is that human beings can alter their lives by altering their attitudes of mind." Doctors, in their diagnostic activities, both physical and mental, can be of great help to the person concerned, but only that person can work out the most effective "modus operandi" for himself. The will to have good health is of greater importance in obtaining health and longevity than having octogenarian ancestors.

Dr. Charles E. North of the Class of 1900, College of Physicians and Surgeons, Columbia University, noted at the class reunion in 1940 that 68 of the 175 members had died. He asked how many had had a physical examination during the year. Not a hand was raised. At his request the group organized a Committee on Longevity. Each member was asked to have a physical examination each year. "The discoveries made by the committee were startling." The 107 remaining members of the class began giving serious attention to their health. Great improvement was shown in the following years. "Of course it was not always easy to overcome the inherent inertia that is present even in physicians." However, "there was a most impressive change in the psychological attitude of these physicians toward their own problems of senescence. . . ." At their meeting in 1942, a new disease with an impressive name was first described—*adiophoria*. "A heart specialist defined adiophoria as a deficiency that is a sure indication of the aging process and is evidenced by laziness, inertia, lack of interest and postponement of effort." (Gumpert: *You Are Younger Than You Think.*)

At least one member (the author) of the University of Michigan group of retirees has greatly benefited by an annual physical examination. He had rather precarious health until in his thirties. At that time he read an article by William Howard Taft on the great work of the Life Extension Institute of New York City. Acting on Taft's recommendation he went to New York for a thorough physical examination by at least a half dozen doctors at the Institute. His health soon began to improve. He became so interested that he followed instructions as faithfully as if he were a Wolverine football player getting ready for the Ohio State game. Each year during the past forty-five he underwent a thorough physical examination. His physical fitness continued to improve, and remained at a level much above the average for men of his age throughout his working years and for more than a decade into retirement. During his third of a century in Ann Arbor he has had only one brief illness, and contracted a cold only twice. (In some cases, apparently Ann Arbor may be a health resort.) In 1955 the University of Michigan instituted a complete, extensive program of health examinations for the staff, including retired members. This emeritus professor took the examinations when they were first offered. In his eighties he went through all of them again, even though some of the examinations were a "bit rugged." The staff doctor in the university of Michigan Health Service who summarized the findings of the various examinations remarked that he had

no suggestions to make for improvement of health. Seemingly it is possible, barring accidents, for a person to plan for and obtain the kind and quality of of health he desires. Yet I cannot recall any of my progenitors who lived to fourscore years. Very few of them reached the age of 70. My father retired at 58 and died of old age at 67.

ACTIVITIES WITH A PURPOSE

Every person needs daily physical exercise beyond that required to dress and eat. The exercise should be varied; at least part of it ought to be taken out in the open. It ought to be enjoyable rather than prescribed. It need not be, and *should not* be, as strenous as that undertaken in earlier years. There ought to be zest in the exercise, and it should be arranged to suit the individual. Several years ago while I was visiting an elderly friend, he arose from his chair, took his cane, placed his thumb in a notch on the handle, eased himself down from the porch and started for a walk. With grim determination he walked about two blocks. The course was reversed and he came back to the porch. He slipped his thumb down one notch, then repeated the walk. This was continued until the thumb had slipped to the tenth notch. Then he said, "Now I have done what the doctor prescribed for this forenoon." Question: Of how much value was that prescribed exercise? How much better and more invigorating it would have been to walk with a purpose! Why not forget the required forty blocks and other prescriptions and cultivate an interest in trees, birds, rocks, butterflies, shells, or whatever is available for study and collecting. Quiet, suitable games are also valuable. Basketball, handball, baseball, tennis and other games requiring competition are too strenuous after the age of 50. Swimming, golf, walking, shuffleboard and pitching horseshoes are much better since they can be engaged in at one's own initiative, and alone if necessary. In such games the player does not have to react to the actions of others. Other retired persons find social and community activities interesting, invigorating and helpful. Many retired business and professional men become advisers, and even participants in the development of programs for Boy Scouts, YMCA-YWCA youth activities, and other community groups. Still other retired persons continue directly, with both success and pleasure, some of the more interesting of their former activities. For nearly a quarter century my interests and experiences were in college teaching and college administration, including both a deanship and the teaching of educational administration courses in a large university. During this first decade in retirement many opportunities have come to me to be a consultant to small colleges in different parts of the country. For the most part, endowed foundations have sponsored these activities. It has been a source of pleasure to watch more than a score of colleges develop better organization and administration practices and, as real needs have been discovered, to help them obtain necessary funds to meet the most urgent. At times, foundations and other business organizations interested in helping hospitals and educational institutions do not know where their gifts will yield the largest and best return.

Probably the best example of worthy retirement activities are those engaged in by former President Herbert Hoover. Mr. Hoover has brought dedicated, trained experience to the problems of governmental reorganization and improvement—in such an effective way as to astonish the nation. At the same time these activities have brought to him personal reward, happiness and many added years.

Activities with a purpose are a "must" for retired persons.

ECONOMIC SECURITY IN RETIREMENT

A definite guaranteed income after the regular pay checks cease is a big factor in the life of every retiree. It is not all-important that the funds be large; we see wealthy retirees who are less happy than others with meager incomes. The important point is that the income be secure, and that payments arrive on a regular schedule. There are numerous plans which can be followed. It is necessary to make and follow some plan which will guarantee that income will be available when needed. During the active earning years, after the plan has been adopted, the going may become a bit strenuous at times. Occasionally the family may find it necessary to omit some youthful indulgences in order not to interrupt the adopted pre-retirement plans. However, satisfactions in later years will make up fully for any earlier sacrifices. Thousands of college and university faculty members as well as business and professional men in retirement can and do express great thankfulness that they made and carried out sound economic retirement plans prior to separation from the job.

HOBBIES

Activities of the most stimulating, wholesome sort during retirement often originate through hobbies. Hobbies do provide self-starters. They furnish opportunities for self-expression, relaxation and self-enlargement. An absorbing hobby is almost a requisite for real satisfactions during retirement years, but it is not always possible to select the most suitable hobby just as one is leaving his fulltime job. It is wiser to select a possible hobby activity well in advance of retirement. "Ride" the hobby for a while; give it up or change to a more personally satisfactory one if the first choice is not the most suitable. Choosing an individually suitable leisure-time activity a decade or more in advance of the retiring date is usually an exceedingly wise move. Too often, retirement tragedies are strewn along otherwise anticipated enjoyable journeys merely because the retirees developed no enticing interests. We who are enjoying years of active, challenging retirement meet these unhappy retirees all along the way. Most of them are too set in their ways to make a change at this late date. Personal interests or hobbies are a necessity for a normal life after separation from one's life work.

SOCIAL AND SPIRITUAL INTERESTS AND OUTLETS

To live unto one's self and enjoy it is impossible for a normal human being. Our inherent social and spiritual natures need exercise and they need outlets.

During busy, work-a-day lives we naturally mingle with others and thus find suitable opportunities for expression. A continuation of these interests beyond the threescore and ten years can be had only by a bit of judicious thoughtful planning during a considerable number of years prior to retirement. Unless such plans are made early in life these areas of our nature atrophy, dry up and die. When this happens we see the beginning of the retired "crab" who thinks only of himself. He believes the world is against him. Also, God's purpose for his life is thwarted. Others miss what he might have contributed to fuller living in his family and community. He misses the greatest of all inner satisfactions—that which comes in our quieter moments as we reflect and recall unselfish experiences.

Abstracts of Current Literature

RADIATION ILEITIS.

Abrahamson, R. H. *Arch. Surg.* **81:** 553 (Oct.) 1960.

Instances of radiation injury to the ileum are reviewed. With the intensive use of radiation therapy, such injuries are likely to increase in number. Abdominal and pelvic radiation is often administered after laparotomy. In some of these cases, and even with intensive application of radium to the cervix, adhesions will form and hold the ileum immobile. There will be a history of radiation and in the acute phase there may be weight loss, anemia, gastro-intestinal bleeding, nausea, vomiting, perforation with peritonitis, and adhesions from previous laparotomy or radium implantation. The chronic phase may be characterized by the malabsorption syndrome, melena with repeated blood loss, and chronic partial or acute complete intestinal obstruction. The patient may recover from an acute phase and later have a recurrence of gastro-intestinal symptoms. The diagnosis may remain obscure until obstruction has taken place. The damage caused by radiation may consist of edema, mucosal ulceration, endarteritis of the mesentery, further ulceration of the mucosa with fistula and abscess formation, and fibrosis, stenosis, and destruction. Treatment consists of decompression with fluid, electrolyte, and blood replacement followed by an exploratory laparotomy with drainage of abscesses, excision of fistulae, and intestinal resection. The case presented of a 61-year-old woman is one of focal ulcerative and cicatrizing ileitis due to the effects of combined radium and roentgen-ray therapy. The patient had recurring gastro-intestinal symptoms over a 20-year period. Many diagnoses were made but the correct one was made only at operation, during which adhesions were severed and obstruction in the bowel resected.

TOTAL BODY POTASSIUM AND GROSS BODY COMPOSITION IN RELATION TO AGE.

Allen, T. H.; Anderson, E. C., and Langham, W. H. *J. Gerontol.* **15:** 348 (Oct.). 1960.

Total body potassium, measured by gamma-ray counting of the naturally occurring K^{40} isotope, provides a rapid and effective means of studying gross body composition. Total body potassium content is proportional to the body mass minus bone mineral, fat, and water (M_3) derived from the body water (W) according to the expression $M_3 = (0.276 \pm 0.0057)$ W. During growth, both body potassium and M_3 increase linearly with age. In adulthood, M_3 and potassium appear to depend on both age and sex. The ratio of K/M_3 decreases with increasing age and is lower for females than for males. The physiologic significance of decreasing K/M_3 with age is not apparent. It may indicate a basic change in cellular metabolism or a net loss in muscle mass with replacement by connective tissue having approximately the same degree of hydration. When corrected for age and sex, the correlation between M_3 derived from body potassium and body water is quite good, when body potassium is determined by either K^{40} counting or K^{42} dilution, and body potassium measurements provide a simple and rapid method of estimating body composition. An interesting correlation is observed between total body potassium and basal metabolic rate, but further study is required to explain the detailed structure of this relationship. (From authors' summary.)

USE OF CYCLOPHOSPHAMIDE IN ADVANCED MALIGNANCIES.

Aronovitch, M.; Meakins, J. F., and Groszman, M. *Canad. M. A. J.* **83:** 997 (Nov. 5) 1960.

Cyclophosphamide (Endoxan; Procytox) is N,N-bis-(beta-chlorethyl)-N, O-propylene-phosphoric ester diamide. Cleavage of the compound takes place in the cell and a type of nitrogen mustard is formed in actively proliferating cells. This breaks into imine linkages

that react quickly with enzymes, amino acids, and desoxyribonucleic acid of the cell nucleus. The compound may be used in various dosage schedules and given intravenously, intramuscularly, orally, or into body cavities. The usual dose has been 200 mg. intravenously daily, for five to seven days. Thereafter, it has been reduced to 100 mg. daily given by any convenient route. Among 43 malignancies treated, clinical or objective improvement was noted in 22 but no improvement in 21. Twelve patients were terminal and treated for less than a month. Excluding these from the series, there were 31 cases, with improvement in 18. Subjective improvement was manifested by an increase in the sense of well-being, a better appetite, and weight gain. Considerable lessening of bone pain was noted. Objective improvement was measured by a decrease in the size of masses in the lung or mediastinum or by the disappearance of pleural fluid—as illustrated by case summaries. Skin lesions regressed for a while, and edema of the extremities disappeared. Glands in the neck were either not affected or grew larger. It was found that the shrinkage in tumor size could take place rapidly. An attempt was made to keep the white blood cell count above 2000; this was possible even with continuous therapy. There was some indication that cells of the marrow could recover their function while cells of the neoplasm were still being affected, so that leukopenia was not an index of the efficacy of treatment. Among the entire group, 17 patients showing improvement made favorable progress for a number of months. Of 12 patients treated longer than six months, 6 died, 3 have no radiographic or clinical evidence of disease, and 3 are well but have radiographic and clinical evidence of cancer. Among 3 treated for over a year, 1 has no symptoms of disease, and cancer is evident in 2. As for complications, anemia and thrombocytopenia were sometimes seen. Nausea and vomiting at the onset of therapy disappeared during the course of treatment. It was not possible to overcome the loss of hair by women. Other agents are being used in conjunction with cyclophosphamide. It is concluded that they, together, can make the patient comfortable and prolong life.

EFFECT OF INTRAVENOUS ADMINISTRATION OF CRYSTALLINE PANCREATIC DESOXYRIBONUCLEASE IN PATIENTS WITH GOUT.

Ayvazian, J. H., and Ayvazian, L. F. *New England J. Med.* **263:** 999 (Nov. 17) 1960.

Pancreatic desoxyribonuclease injected intravenously into normal subjects caused only slight increases in serum uric acid levels but no significant change in uric acid excretion. In gouty patients, injection of the enzyme caused a fall in serum uric acid levels and a rise in uric acid excretion, both of which were of greater magnitude in patients with symptomatic gout. This suggested a variation in accordance with the degree of acute inflammatory activity. Studies are under way to determine the mechanism of this response.

LICHEN SCLEROSUS ET ATROPHICUS.

Cockerell, E. G.; Knox, J. M., and Rogers, S. F. *Obst. & Gynec.* **15:** 554 (May) 1960.

Lichen sclerosus et atrophicus is benign and does not require surgery. A case is reported in which the disease recurred after an erroneous diagnosis of kraurosis vulvae had been made and vulvectomy performed. The diagnosis usually can be made by noting the features of a typical lesion and considering the location of the eruption. The disease ordinarily begins late in life and is more frequent in women than in men. It has a predilection for the vulva and perianal region, the upper part of the trunk, the neck, the axillae, and the forearms. The typical lesion is an irregular, often polygonal, flat-topped, white macule or flat-topped papule. A mother-of-pearl color is characteristic and an erythematous or pigmented zone may surround the papules, which may be discrete or grouped. The surface of the papule is likely to have on it dark, comedo-like plugs or minute depressions at the orifices of the pilosebaceous structures or sweat pores. These become more prominent as atrophy pro-

gresses. In the stages of involution, tissue paper-like wrinkling is seen. Histologically, there is epidermal atrophy, keratotic plugging, liquefaction degeneration of the basal-cell layer, and homogenization of the connective tissue in the upper cutis. A perivascular infiltrate may sometimes be seen in the mid-dermis. Lichen sclerosus et atrophicus must be differentiated from kraurosis vulvae, leukoplakia, and senile atrophy. *Kraurosis vulvae* is an atrophic process, sometimes with edema as a prodromal symptom. Pigmentation and depigmentation vary from case to case. The process usually is confined to the perineum, the clitoris, and the labia minora. Atresia or stenosis of the vaginal orifice may occur. It is questionable whether the lesion is precancerous. Histologic examination shows atrophy of the malpighian layer and the cutis. Arteriosclerotic changes are found in the deep vessels of the dermis. Keratotic plugging is absent, but there may be liquefaction degeneration of the basal-cell layer. In *leukoplakic vulvitis*, single or multiple plaques involve the inner surfaces of both labia, the perineum, the clitoris, the vaginal mucosa, or all of these areas. Pruritus is intense. The lesions are whitish to gray or blue. The epidermis becomes thickened and fissures or ulcerations may appear. A malignant change develops in approximately half of the cases. Essentially a hypertrophy, the process often leads to atresia or stenosis of the vaginal orifice. Microscopically, hypertrophy of epidermal layers is seen with subpapillary atrophy of the corium and loss of elastic tissue. Premalignant dyskeratotic phenomena are present in advanced cases. In *senile atrophy*, the skin is wrinkled, thin, glossy, freckled, and telangiectatic, sometimes with brownish discoloration and leathery thickening. Itching usually is present. Histologically, there is atrophy of the epidermis and dermis, keratotic plugging, and mild changes in the dermal vessels.

NEUROSURGICAL ALLEVIATION OF INTENTION TREMOR OF MULTIPLE SCLEROSIS AND CEREBELLAR DISEASE.

Cooper, I. S. *New England J. Med.* **263:** 441 (Sept. 1) 1960.

An investigation was carried out which showed that intention tremor—the widely oscillating tremor observed during voluntary motion—produced by diverse diseases can be abolished by inflicting a surgical lesion in the region of the ventrolateral nucleus of the thalamus in a manner similar to that used in relieving the resting tremor of Parkinson's disease. The causes of intention tremor in 12 cases treated were as follows: severe brain trauma, 2; multiple sclerosis, 6; familial cerebellar degeneration, 2; severe cerebellar degeneration of unknown origin, 1; and olivopontocerebellar degeneration, 1. The patients were aged 20 to 68 years. Incapacitating cerebellar tremor had been present for three to more than thirty years. The lesion placed by the technic described successfully relieved the tremor in 10 of the 12 patients and lessened it in one. In the remaining patient, a pre-existent spastic hemiparesis was aggravated by surgery. In addition, in 3 patients among 5 who had marked spontaneous nystagmus prior to operation, diminution of the nystagmus followed operation. In 7 cases improvement in intention tremor of the extremities ipsilateral to the side of operation also occurred—a finding that has not been a feature in cases of bilateral Parkinson's disease or resting tremor. Marked improvement also occurred in 5 of 7 patients with constant tremor of the head. One of the patients relieved of intention tremor after operation died of agranulocytosis two months later. The remainder have remained free of recurrences. Four illustrative case reports are given.

IL CUORE POLMONARE CRONICO SENILE. (CHRONIC SENILE COR PULMONALE).

Dalla Volta, S.; Forattini, C., and Zerbini, E. *Giorn. Gerontol.* Suppl. 18. VII Congresso Nazionale Della Società Italiana di Gerontologia e Geriatria Genova, December 15–17, 1958.

Appraisal and statistical analysis of clinical findings and technical study in aged persons with chronic cor pulmonale, with and without cardiac insufficiency, yielded the following conclusions: A senile type of chronic pulmonary heart disease can be demonstrated which

differs from the disease in younger persons. In the elderly, resting dyspnea is observed more frequently in the first stage due to more severe impairment of ventilation which, in turn, is dependent upon thoracic causes as well as chronic bronchitis, pulmonary emphysema, and increased functional dead space. Cyanosis is seldom observed, and then it is mild or moderate. Polycythemia is infrequent and occasionally true anemia can be found. At the outset, physical and roentgenographic examinations yield little information: dilatation of the cardiac section of the right heart is scarcely visible following descent of the diaphragm. Eventually convexity of the middle left arch and counterclockwise rotation of the heart frequently are observed. In a more advanced stage, dilatation of the outlet chamber of the right ventricle is seen. Electrocardiographic patterns are dependent upon the vertical position of the heart, associated with right ventricular hypertrophy and right auricular enlargement. Tachycardia is constant. The QRS complex shows low voltage with an rS type on precordial leads. Other electrical abnormalities such as auricular fibrillation, A-V block, and bundle-branch block are related to concomitant cardiac conditions such as hypertension and coronary heart disease. Hemodynamic studies reveal mild pulmonary artery hypertension, normal pulmonary artery wedged pressure, protodiastolic right ventricular and mean right auricular hypertension. Pulmonary arteriolar resistance and cardiac output are only slightly augmented in comparison with younger persons. Pulmonary function tests show chronic obstructive emphysema with dominant impairment of alveolar ventilation. The causes of chronic cor pulmonale in old age are related to diffuse obstructive emphysema with voluminous, hyperdistended lungs, frequently to pulmonary bullae, and to signs of obstruction of pulmonary pathways. The relief of anoxemia, which is the pathophysiologic basis of emphysema, permits improvement of chronic pulmonary emphysema in the first stage under the influence of proper therapy. Prognosis is poor in the more advanced cases of pulmonary heart disease. Treatment must be directed toward the correction of anoxemia, with control by repeated determinations of O_2 and CO_2 concentrations in the arterial blood. Treatment consists of highly concentrated oxygen therapy combined with artificial control of respiration (*e.g.*, pneumatic rooms), bronchospasmolytic and bronchodilator drugs, protracted use of corticosteroids in small doses, bed rest, and dietary control. Venesection must be employed with care. Cardiac glycosides are reserved for acute emergencies and cases of cardiac insufficiency. Diuretic agents such as acetazolamide are useful. Nicotinamide also is useful in the forms with pulmonary arteritis. Morphine and its derivatives are contraindicated because of depressant action on the respiratory center, which is nonexcitable because of chronic hypoxia. All therapeutic measures through relief of anoxemia alleviate resting pulmonary hypertension and protect against right heart failure. (From authors' summary.)

RHEUMATIC MUSCULOSKELETAL SYMPTOMS ASSOCIATED WITH CARCINOMA OF THE PROSTATE GLAND.

Harrison, J. W. and Scherbel, A. L. *Postgrad. Med.* **28:** 274 (Sept.) 1960.

Seven patients are presented who were evaluated for musculoskeletal symptoms that suggested rheumatic disease, but were found to have carcinoma of the prostate gland. All symptoms had developed after the age of 60 years. This brings to light an association between rheumatic diseases and carcinoma of the prostate. In the patients affected, there is usually an acute onset of synovial symptoms with inflammation, swelling, heat, and accumulation of fluid. The rheumatic symptoms can occur without metastases. The possibility is considered that some enzymochemical reaction in cancer tissues is capable of initiating a reaction in the connective tissue in some other area. Six of the patients had rheumatic symptoms, and the seventh those of dermatomyositis. Initially 5 patients had symptoms of mild urinary obstruction and 2 had urinary-tract infections. The patient with symptoms resembling dermatomyositis had a metastatic lesion in a cervical lymph node that led to a biopsy and confirmation of the diagnosis. All of the patients were severely disabled and in great pain. Each was treated with estrogen. Six patients were followed for one to three

years; 1 was lost to follow-up. Four patients received oral estrogen only; 3 received intravenous estrogen followed by oral estrogen. Rheumatic symptoms disappeared from 5 patients. Treatment failed in 2 patients who responded initially. One of these could not be followed and the other, because of edema, was not able to tolerate doses of oral estrogen sufficient to be effective. Since rheumatoid arthritis in 90 per cent of cases occurs before age 60, it is postulated that the onset of rheumatic symptoms after this age may be a cryptic sign of malignant disease.

THE SURGICAL TREATMENT OF EMPHYSEMATOUS BLEBS AND LOCALIZED VESICULAR AND BULLOUS EMPHYSEMA. ANALYSIS OF 50 CASES.

Head, J. M.; Head, L. R.; Hudson, T. R., and Head, J. R. *J. Thoracic & Cardiovasc. Surg.* **40:** 443 (Oct.) 1960.

Emphysematous blebs are usually associated with pulmonary emphysema, although they sometimes develop in healthy lungs. They usually are multiple and bilateral but may be single and unilateral. These blebs tend to enlarge and they predispose to carcinoma. Thirty-one patients with emphysematous blebs were operated upon. Three were lost to follow-up. Of 16 with blebs on normal lungs, 4 were treated with Monaldi suction, 10 by resection, and 2 by both procedures. Of 12 with blebs complicated by pulmonary emphysema, 7 were treated by Monaldi suction, 4 by resection, and 1 by both procedures. The open operation has become the preferred surgical procedure in most instances. All of the patients with pure blebs had excellent immediate and long-term results. The immediate effect of surgery was good in the cases of blebs complicated by pulmonary emphysema. However, only 6 of these patients noted a good late result. These patients eventually die of emphysema. In localized vesicular and bullous emphysema the inelastic lungs are too large for the thorax. The crowding forces the diaphragm down and out of function, contributes to a reduction in maximal breathing capacity, and results in a relative cardiac tamponade because of increased pressure on the large veins and auricles. Resection of the most severely involved areas aims to reduce the size of the lung, correct these abnormalities, and bring the more normal portions of the lung back into function. Most patients affected can be made functional by medical treatment and/or pneumoperitoneum. Nineteen patients underwent operation. These cases were selected because parts of the lung were more involved than others; patients with generalized disease were excluded because they had too little normal lung remaining. One patient was treated by Monaldi suction, 16 by pulmonary resection, and 2 by Monaldi suction plus resection. There were 4 operative deaths. Two patients appear to be permanently cured. Three followed for six months are much improved. Two patients died at five months and three years following operation. The remaining 8 patients experienced a return of symptoms from four months to four years after operation. Although the immediate result in this condition may be good, the symptoms usually return, become progressive, and terminate in right heart failure.

HYPOTENSIVE ACTION OF BRETYLIUM TOSYLATE (DARENTHIN).

Hodge, J. V., and Smirk, F. H. *Am. Heart J.* **60:** 539 (Oct.) 1960.

Bretylium tosylate was used for one to eight months in 100 patients with arterial hypertension, many of whom had experienced parasympathetic side-effects with ganglionic blocking drugs. The dosage was two or three 200-mg. tablets daily. The aim was to obtain a reduction in blood pressure to, or near to, normal levels in the trough of the fall. The drug alone satisfactorily controlled blood pressure in 46 patients at an average dosage of 329 mg. Among 24 patients receiving chlorothiazide, hydrochlorothiazide or a rauwolfia alkaloid at the start of treatment, the mean effective dose was 278 mg. The other 30 patients were not controlled by 600 mg. of bretylium tosylate alone, and a low dose of a ganglionic blocking drug was added in order to secure control. The fall in blood pressure was greatest with the patient in the standing position, was of intermediate degree in the sitting position, and was least when lying down. No consistent change occurred in pulse rates, although some patients showed moderate slowing upon initiation of therapy. Two patients showed decreases in pulse rates to 54 and 40 per minute, respectively, on the second day. The dosage of bretylium

tosylate required to bring the blood pressure to a nearly normal level could be reduced by giving patients 500 mg. of chlorothiazide or 50 mg. of hydrochlorothiazide twice daily. The effect of reserpine on the fall in blood pressure after bretylium tosylate has yet to be clarified, but the average single dose of the substance was reduced to 26 mg. when reserpine was given with it. Slight drug toleration was found in 4 patients, and definite toleration in 5. The increase in dosage usually was less than twofold, but larger doses were sometimes required. Mild looseness of the bowels occurred in 20 per cent of the patients and hyperactive bowel sounds in 40 per cent. Indigestion occurred or became worse in 15 patients. One patient noted blurring of vision to the same degree as with pempidine given previously. Approximately half of the patients had symptoms referable to the eyes. The nonvisual symptoms were sensations of heaviness, pressing, lifting or pulsing, soreness of the eyeballs, and irritation of the conjunctivae, sometimes accompanied by mild suffusion and increased lacrimation. The visual symptoms were blurring of near and distant vision which, however, did not constitute a serious problem in management. Flashes of color at the periphery of both visual fields occurred in one patient at the time of maximal drug action. Forty per cent of the patients noted significant nasal congestion. Approximately 25 per cent reported pain over the region of the parotid glands, often aggravated by eating. The effectiveness of a dose large enough to reduce blood pressure usually lasted five to six hours, but sometimes the effect of a single dose lasted sixteen hours. Three doses per day usually furnished adequate coverage throughout twenty-four hours. The response to large doses of bretylium tosylate was less predictable than the response to ganglionic blocking agents.

MASSIVE INTESTINAL INFARCTION WITHOUT VASCULAR OCCLUSION ASSOCIATED WITH AORTIC INSUFFICIENCY.

Hoffman, F. G.; Zimmerman, S. I., and Cardwell, E. S., Jr. *New England J. Med.* **263:** 436 (Sept. 1) 1960.

Three cases of massive intestinal infarction without mesenteric vascular occlusion, associated with aortic insufficiency, are reported, together with a review of 2 cases from the literature. In 1 case, abdominal pain preceded the fatal episode by one month; in the other 3, it was part of the terminal episode. Congestive heart failure was present in 2 of the 5 cases in the series. In 4, the cause of the aortic insufficiency was syphilis. No histologic evidence that this disease contributed in any way to the development of intestinal infarction was found. Massive intestinal infarction without vascular occlusion is an uncommon occurrence. Although we wish to call attention to its association with aortic insufficiency, it may occur rarely with other types of heart disease and in a variety of unrelated conditions. When associated with aortic insufficiency, the infarction was always related to distribution of either the superior or the inferior mesenteric arteries, or both, in sharp contrast to the segmental distribution of this lesion reported in cases not associated with aortic insufficiency. Various mechanisms have been proposed, and are reviewed, in an attempt to explain the pathogenesis of intestinal infarction without occlusion. Of these, the physical basis that involves the law of LaPlace is attractive. It is not possible to explain unequivocally the cause of abdominal pain noted with aortic insufficiency. It is suggested that possibly one, or a combination, of the mechanisms discussed may be involved. In only 1 patient did pain precede by any significantly long interval the onset of intestinal infarction. (From authors' summary.)

NIERENFUNKTION UND ORALE DIABETES-BEHANDLUNG (KIDNEY FUNCTION AND ORAL DIABETIC TREATMENT).

Hümmer, N.; Lehrnbecher, M., and Moeller, J. *Deutsche med. Wchnschr.* **85:** 13, 501, 1960; through Ciba Literature Review **5:** 376, 1960.

The treatment of diabetes with sulfonamides occasionally leads to improvement in renal function. Systematic tests carried out in the course of treatment with the oral antidiabetic, carbutamide, yielded the surprising finding that patients with a glomerular filtrate of less than 100 ml. per minute responded better to the oral treatment than those with a greater

glomerular filtrate. In order to examine this question more closely, carbutamide clearance tests were performed in 19 diabetic patients and 11 nondiabetic persons. Both groups included patients with high and low glomerular filtration rates. It was found that both diabetic and nondiabetic patients with a high glomerular filtration rate reacted less to oral antidiabetic agents. The blood level was of less significance. The parallelism between glucose and carbutamide excretion in the urine appeared particularly striking. It is concluded that glomerular filtration is the most important factor governing the response to carbutamide, although apparently not the only one. This explains why juvenile diabetic patients, in whom filtration is as a rule higher owing to their youth, show a poor response to oral therapy for their metabolic disease.

ANGIOTENSIN THERAPY OF CIRCULATORY FAILURE IN MAN.

Jablons, B.; deCastro, E. G.; Vichayanonda, V.; Manulat, P. E., and Santiago L. S. 33rd Scient. Session, Am. Heart Assoc., (abstract) *Circulation* **22:** 766 (Oct.) 1960, Part 2.

Synthetic angiotensin, 5-valine octapeptide, therapy was studied in 15 males and 4 females, aged 29 to 86 years. Seven were in a state of complete circulatory collapse (group A), 7 were hypotensive from shock and other causes (diastolic 60 mm. Hg or below) (group B), and 5 were normotensive. Angiotensin was administered in doses of 0.5 mg. in 20 ml. or 1,000 ml. of 5 per cent dextrose-saline intravenously, or in 60 ml. intramuscularly. Blood pressure rose in from two to five minutes in the hypotensive and normotensive groups, the rise varying directly with the increasing and decreasing amounts administered. In group A, blood pressure response was demonstrable only thirty to sixty minutes after infusion of angiotensin was begun. (In group A, 2 patients showed no response to doses in excess of 50 μg. per minute.) Four of 7 patients in a state of complete circulatory collapse survived after continuous angiotensin therapy for twelve to forty-eight hours. One patient, after initial recovery, died of uremia seven days later. Deaths in this and other groups were unrelated to the angiotensin administered. No local reaction followed intramuscular injection or extravasation. Side-effects were only facial flushing in 3 and abdominal cramps in 1. Angiotensin was compared with norepinephrine in 5 cases. In 4 cases, angiotensin was equipotent in one-eighth the amount; in the fifth, norepinephrine was ineffective, and angiotensin increased the blood pressure by 40 mm. Hg systolic and 40 diastolic. Angiotensin is a potent vasoconstrictor agent, with minimal side-effects, and with a protracted action in many of the patients studied.

PELIOSIS HEPATIS AFTER ADMINISTRATION OF FLUOXYMESTERONE.

Kintzen, W. and Silny, J. *Canad. M.A.J.* **83:** 860 (Oct. 15) 1960.

Peliosis hepatis was discovered at necropsy following prolonged daily administration of 20 mg. of fluoxymesterone (Halotestin), a potent anabolic androgenic compound, to a patient with osteolytic metastases to the skull and bones following removal of an infiltrating mammary-duct carcinoma. Because most previously reported cases have been observed in patients dying of massive tuberculosis, a catabolic protein-wasting process depleting the liver, the question is raised whether a similar depletion of liver cells could be the cause of peliosis hepatis due to the protein-shifting action of potent androgenic compounds. If such a theory is correct, did the protein anabolic drug strengthen the skeleton while the parenchymatous framework of the liver collapsed?

RENAL ULTRADIALYSIS AS AN ADJUNCT IN THE SURGICAL TREATMENT OF HEART DISEASE.

Lemmon, W. M.; Bailey, C. P.; Hirose, T., and O'Connor, R. A. 33rd Scient. Session, Am. Heart Assoc., (abstract) *Circulation* **22:** 777 (Oct.) 1960, Part 2.

A problem all too frequently faced by the cardiac surgical team is the patient with a potentially remediable lesion in intractable congestive heart failure. It occurred to the

authors that application of the artificial kidney in such instances might possibly succeed when all other forms of medical therapy had failed to "dry out" the patient. Others have employed dialysis in patients in congestive heart failure, but none has reported following through with surgical correction of the underlying lesion. Such cases carry a high risk for dialysis and heart surgery, but the risks must be accepted. Without the twofold attack on the dual problem the mortality with medical therapy is practically 100 per cent. Once the patient is relieved of congestive heart failure, a proper work-up can be performed, including diagnostic tests and evaluation for operation. After the program is inaugurated, the regimen must be pursued quickly and vigorously, including operative intervention with correction of the lesion. Otherwise there will be a relapse into a condition of intractable failure. Dialysis may have to be repeated on one or more occasions. Patients refractory to all diuretic measures may have profuse diuresis subsequent to successful renal dialysis. There are several possible explanations for this phenomenon. Each dialysis, using a hypertonic bath solution, is run with a full laboratory control and is continued to the physiologic limit for the patient. This preliminary report summarizes initial experience with the artificial kidney, employing the ultrafiltrate principle, in patients with intractable heart failure.

CHANGE IN SERUM LIPID LEVELS WITH AGE: FIVE-YEAR LONGITUDINAL STUDY

Schaefer, L. E.; Steinberg, A. G.; Adlersberg, D., and Ramirez, G. 33rd Scient. Session, Am. Heart Assoc., (abstract) *Circulation* **22:** 805 (Oct.) 1960, Part 2.

This investigation involved the re-examination of an ambulatory population five years after a previous study. Twelve hundred persons from 2 to 72 years of age were originally investigated, and average lipid levels computed for five-year age groups. All available participants in the study are being systematically recalled, and to date approximately half have been re-examined. It has thus been possible to calculate the actual change with age for several different age groups over a five-year period. The actual change with time was always in the same direction and of approximately the same magnitude for all ages in both sexes as the change which had been predicted from the original study. Confirmation of the following predicted trends in serum cholesterol level was obtained: in the female, preadolescent increase, relative constancy from postadolescence to the mid-30's, and a marked increase after age 35; in the male, a pre- and postadolescent fall and rise of considerably less magnitude than in the female, a sharp increase from age 20 to 40, and relative constancy after age 40. The average change for a group was not demonstrated by all individuals in the group. For example, the average change for 40 preadolescent females was from 210 mg. per 100 ml. at age 8 to 193 mg. at age 13, but in 11 of the 40 the cholesterol level increased rather than decreased. In approximately 35 per cent of subjects in each age group there was a move in a direction opposite to the general trend. Usually this opposite movement occurred in persons with low levels if the subsequent change for the group was downward, and in persons with high levels if the subsequent change for the group was upward. It is possible that the age-change pattern for cholesteremia in an individual will provide a more accurate reflection of the presence or absence of abnormal lipid metabolism than the evaluation of a single lipid value at a given point in time.

SENSITIVITY TO PAIN IN THE AGED.

Sherman, E. D. and Robillard E. *Canad. M.A.J.* **83:** 944 (Oct. 29) 1960.

Sensitivity to pain was determined by the Hardy-Wolff-Goodell dolorimeter in 90 normal persons aged 23 to 30 years and in 110 between the ages of 65 and 97 years. Each group contained Anglo-Saxon, French, and Jewish subjects. Two end-points were measured for cutaneous pain: 1) a beginning jab sensation for the pain perception threshold, and 2) the first evidence of wincing, as manifested at the outer canthus of the eye, for the pain reaction threshold. Pain sensitivity decreased with age, both as to perception and reaction, in all groups. The differences between the old and young groups were statistically significant. Males had higher pain thresholds, but the differences between men and women were sig-

nificant only for the older Anglo-Saxon male for perception and reaction, and for the young Anglo-Saxon male for pain perception. The average responses for the French and Jewish subjects were substantially the same. The average response in the Anglo-Saxon group was significantly higher than the combined response in the French and Jewish subjects. A relatively smaller deviation was found for the variation in threshold in a given subject, compared with those for the entire group. Age was judged to account for these differences.

AGE TRENDS IN THE ELECTROCARDIOGRAM OF "HEALTHY" MEN AND WOMEN. Simonson, E. and Blackburn, H. W. 33rd Scient. Session, Am. Heart Assoc., (abstract) *Circulation* **22:** 812 (Oct.) 1960, Part 2.

QRS and T deflections were measured in the 12-lead electrocardiograms of 649 healthy men and 311 healthy women (total, 55,000 measurements). The mean figures in four age groups were compared: third decade (115 men, 104 women), fourth decade (110 men, 65 women), fifth decade (214 men, 65 women), and sixth decade (210 men, 77 women). The difference in sample size of sexes was corrected in the statistical treatment. Relative body weight was close to normal (100 per cent) in all groups. A greater number of significant electrocardiographic differences appeared with aging (26 in men and 10 in women), and the differences were larger in men than in women. The amplitudes most representative for general QRS and T voltage (lead II, ΣQRS and ΣT for the frontal plane), lead V_2 (largest negative QRS deflection), and V_4 (largest positive QRS deflection for the horizontal plane) decreased with age but more so in men (both absolutely and in percentage of the values for the youngest age group). The differences in the decrease of QRS and T amplitudes between men and women were statistically significant. The finding of more pronounced electrocardiographic age-trends in men than in women supports the concept that these trends may be related to greater coronary atherosclerotic changes with age in men (established in autopsy material) and to the higher coronary death rate for males. Analysis of electrocardiographic age-trends may provide a sensitive index of the prevalence of clinically latent coronary atherosclerosis in populations.

CLINICAL EXPERIENCES WITH CHLORPROPAMIDE: A ONE YEAR STUDY. Tolstoi, E. *Metabolism* **9:** 1025 (Nov.) 1960.

Among 15 diabetic patients receiving chlorpropamide, treatment had to be discontinued in 4 because of ketosis and in 2 because of unexplained weight loss. The remaining 9 patients were followed for a year with chemical and various other studies at frequent intervals. During treatment all patients felt well and had no diabetic symptoms or hypoglycemia. Except for 1 patient, all were able to maintain their weight. The fasting blood sugar level fell in all patients. It rose when treatment was suspended for a month in 4 patients. The blood sugar levels varied from patient to patient and reached physiologic values at times only, and not consistently, in 3 of the group. The other patients showed hyperglycemia with the dosage used. Urinary glucose excretion paralleled the height of the blood sugar level. Most of the patients showed a postprandial glycosuria. This was asymptomatic and usually cleared overnight. The blood levels of chlorpropamide varied from month to month with the same dosage, but in general were higher with the larger dosages. They did not parallel the height of the blood sugar levels. The hemograms and results of liver function tests remained within normal limits throughout the study. The patients showed no ketosis. Rather than evaluate the success of chlorpropamide therapy upon blood sugar values, Tolstoi prefers to base it upon the clinical status of the patient. Chlorpropamide enabled some patients with diabetes of "maturity onset" to eat more without inducing symptoms of diabetes, and thus made living more normal. This had not been accomplished without the drug. Patients to receive chlorpropamide must be selected with discretion. Study for weeks or even months may be necessary in order to determine whether a patient with late onset of diabetes is suitable for treatment. In the past, blood sugar studies have been misleading. Maintenance of weight, freedom from symptoms, and a good appetite are more reliable

criteria by which to judge therapy. A poor appetite and weight loss indicate a poor prognosis, and the drug should be discontinued regardless of the blood sugar level.

TESTS OF VENTILATION IN MALES 60 YEARS OF AGE AND OVER.

Wigderson, A. and Kohan, M. *Canad. M.A.J.* **83:** 1068 (Nov. 12) 1960.

One-second and three-second timed vital capacity tests and maximal midexpiratory flow rate tests were performed on 50 males over the age of 60 years, 25 of whom had respiratory complaints such as chronic cough, expectoration, wheezing and dyspnea, and 25 of whom were free of such symptoms. The ventilatory performance of persons without respiratory complaints was better than that of patients with such complaints. However, in a significant number of the patients with no respiratory symptoms, the results of spirometric studies were abnormal. Therefore, the value of these studies in aged patients with respiratory complaints is limited. Since the ventilatory performance is reduced with age, spirometric studies may indicate expiratory delay when this effect is due to aging of the respiratory system rather than to significant tracheobronchial disease.

EFFECTIVENESS OF METHYLPREDNISOLONE AND PRENISOLONE TERTIARY-BUTYL-ACETATE INTRA-ARTICULARLY IN RHEUMATOID ARTHRITIS: A COMPARATIVE STUDY.

Woodbury, J. F. L. and Biechl, A. *Canad. M.A.J.* **83:** 836 (Oct. 15) 1960.

Intra-articular methylprednisolone and prednisolone tertiary-butylacetate are equally potent as anti-inflammatory agents in rheumatoid joint disease. They relieve pain and prevent the re-accumulation of fluid in swollen joints for the same length of time. Compared with joint puncture without injection of the drug, methyl prednisolone was superior in relief of pain and swelling. The duration of relief was significantly longer. The range of motion increased during treatment with methyl prednisolone, whereas improvement in the control group was minimal. Satisfactory dosages in this study of 30 patients with rheumatoid arthritis were 20 mg. of either agent for medium-sized joints, 40 mg. for knee joints, and 50 to 80 mg. for hip joints. The dose was determined, not only upon the size of the joint, but upon the severity of inflammation and disability. Each agent is recommended for intra-articular injection in rheumatoid arthritis.

BOOKS RECEIVED

Receipt of the following books for review is hereby acknowledged. We are glad to publish complete listings of all new books received but such listing must be regarded as a sufficient return for the courtesy of the sender. Books of particular interest will be reviewed in full as time and space permit. Additional information in regard to all listed books will be gladly furnished upon request.

SOCIAL SECURITY: PROGRAMS, PROBLEMS, AND POLICIES. SELECTED READINGS. By *William Haber*, Professor of Economics, and *Wilbur J. Cohen*, Professor of Public Welfare Administration, both of University of Michigan, Ann Arbor. Irwin Series in Insurance. Editors: Edison L. Bowers and Davis W. Gregg. Cloth. $8.75. Pp. 606. Richard D. Irwin, Inc., Homewood, Illinois, 1960.

NURSES CAN GIVE AND TEACH REHABILITATION: A MANUAL. By *Mildred J. Allgire, R.N., R.P.T., M.A.*, Director, Nursing and Therapy Services, and *Ruth R. Denney, R.N., R.P.T., B.S.*, Consultant, Nursing and Physical Therapy, Division of Services for Crippled Children, Indiana State Department of Public Welfare, Indianapolis, Indiana. Paper. $1.25. Pp. 61, with illustrations. Springer Publishing Company, Inc., 44 East 23rd Street, New York 10, 1960.

THERAPY THROUGH HORTICULTURE. By *Donald P. Watson*, Professor of Ornamental Horticulture, Michigan State University, and *Alice W. Burlingame*. Cloth. $4.95. Pp. 134. The Macmillan Company, 60 Fifth Avenue, New York 11, 1960.

MAKING THE LATER YEARS COUNT. By *Austin J. App. Ph.D.*, Associate Professor of English Language and Literature, La Salle College, Philadelphia. Cloth. $3.95. Pp. 177. The Bruce Publishing Company, Milwaukee 1, Wisconsin, 1960.

Ciba Foundation Study Group No. 5. REGULATION OF THE INORGANIC ION CONTENT OF CELLS. Editors for the Ciba Foundation: *G. E. W. Wolstenholme, O.B.E., M.A., M.B., M.R.C.P.* and *Cecilia M. O'Connor, B.Sc.* Cloth. $2.50. Pp. 100, with 16 illustrations. Little, Brown and Company, 34 Beacon Street, Boston 6, Massachusetts, 1960.

Ciba Foundation Symposium on HAEMOPOIESIS—CELL PRODUCTION AND ITS REGULATION. Editors for Ciba Foundation: *G. E. W. Wolstenholme, O.B.E., M.A., M.B., M.R.C.P.* and *Maeve O'Connor, B.A.* Cloth. $11.00. Pp. 490, with 107 illustrations. Little, Brown and Company, 34 Beacon Street, Boston 6, Massachusetts; J. & A. Churchill Ltd., London, 1960.

Ciba Foundation Symposium on CONGENITAL MALFORMATIONS. Editors for Ciba Foundation: *G. E. W. Wolstenholme, O.B.E., M.A., M.B., M.R.C.P.* and *Cecilia M. O'Connor, B.Sc.* Cloth. $9.00. Pp. 308, with 91 illustrations. Little, Brown and Company, 34 Beacon Street, Boston 6, Massachusetts; J. & A. Churchill Ltd., London 1960.

Volume XIII, Ciba Foundation Colloquia on Endocrinology—HUMAN PITUITARY

HORMONES. Editors for Ciba Foundation: *G. E. W. Wolstenholme, O.B.E., M.A., M.B., M.R.C.P.* and *Cecilia M. O'Connor, B.Sc.* Cloth. $9.50. Pp. 336, with 86 illustrations. Little, Brown and Company, 34 Beacon Street, Boston 6, Massachusetts; J. & A. Churchill Ltd., London, 1960.

VISION OF THE AGING PATIENT—AN OPTOMETRIC SYMPOSIUM. Edited by *Monroe J. Hirsch, O.D., Ph.D.* and *Ralph E. Wick, O.D.* Cloth. $7.50. Pp. 328. Chilton Company, Book Division, Philadelphia, New York, 1960.

AGING IN WESTERN SOCIETIES. Edited by *Ernest W. Burgess*, Professor Emeritus of Sociology, University of Chicago. Cloth. $7.50. Pp. 400, illustrated, index. The University of Chicago Press, 5750 Ellis Avenue, Chicago 37, Illinois; Cambridge University Press, London, N.W. 1, England; The University of Toronto Press, Toronto 5, Canada, 1960.

AGING IN THE STATE OF WASHINGTON. Directed and edited by *William S. Hopkins*, Professor of Economics, University of Washington. Cloth. $6.00. Pp. 391. University of Washington Press, Seattle 5, Washington, 1961.

Books for review should be sent to Edward Henderson, M.D., Editor-in-Chief, 236 Midland Avenue, Montclair, New Jersey.